JANUARY 24, 1953 Sa 15 PAGES 153 TO 202

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No. IV OF VOL I, 1953
No. 6752 VOL. CCLXIV

LONDON, SATURDAY, JANUARY 24, 1953
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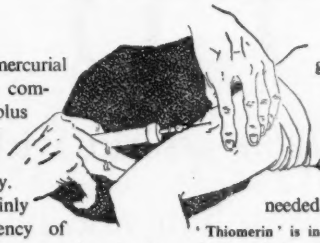

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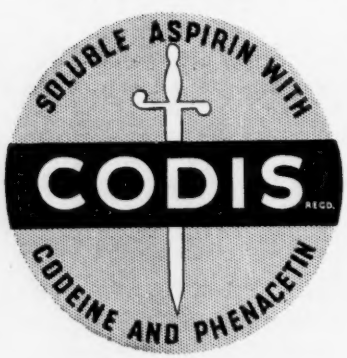

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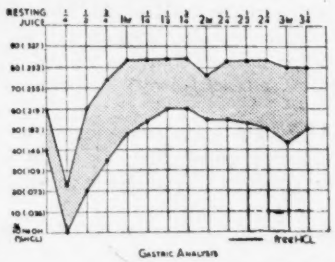

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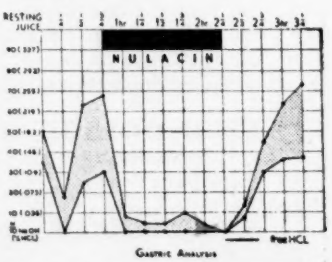

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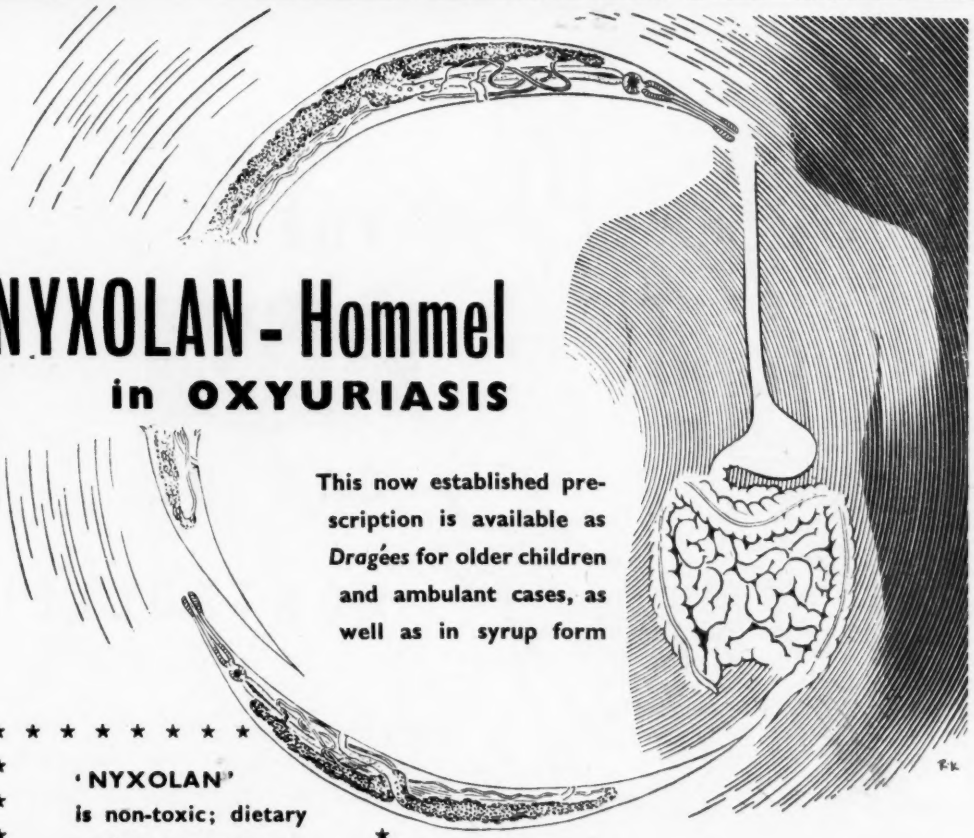

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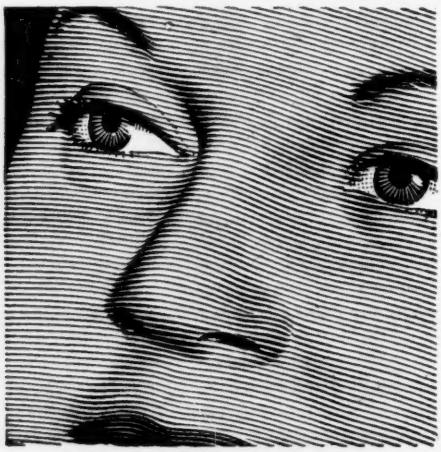

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POSTOPERATIVE WATER AND SODIUM RETENTION

L. P. LE QUESNE M.A. Oxfd, F.R.C.S.
A. A. G. LEWIS B.Sc., M.D. Lond., M.R.C.P.

From the Department of Surgical Studies and the Professorial Medical Unit, Middlesex Hospital, London

FOR many years it has been known that after surgical operations there are changes in the metabolism of water and salt. Pringle et al. (1905) first observed the oliguria following operation. In more recent times interest in the subject was stimulated by the work of Coller et al. (1936) and of Avery Jones and Naunton Morgan (1938), and since that time numerous studies have been made. However, from the accumulated evidence no clear picture of the nature and magnitude of these changes could be drawn. We therefore planned to investigate this problem using the simplest methods, and maintaining as far as possible a fixed intake of water and electrolytes before, during, and after operation. This intake was designed not as the ideal one for routine use, but to demonstrate unequivocally any depression of excretion which might occur postoperatively.

MATERIAL

Cases of gastrectomy in men form the basis of this work, as their study involved the least departure from normal routine.

A group of 21 routine admissions to a general surgical ward was studied. Of the 21 patients, 19 underwent subtotal gastrectomy for benign peptic ulceration, 1 excision of the sigmoid colon for carcinoma, and 1 inguinal herniorrhaphy. All the patients were well-nourished men; their average age was 50·5 years, the range being 31–64 years.

All the patients were operated on under general anæsthesia, a wide variety of agents being used. All received a preoperative injection of either morphine or pethidine (with atropine or scopolamine), and postoperatively all received either of these drugs as required. No difference in our results could be detected from these varying combinations.

Methods

Balance studies were made from 8 A.M. to 8 A.M. for 3–4 days before operation and 1–8 days afterwards; throughout this article the word "day" implies such a balance period. The day of operation is termed day 0. As the operation began at 9 A.M. in all but 2 cases, the preoperative medication was given at the start of a period.

During the preoperative days the patients were fed solely on the following mixture, given by slow drip down a Ryle's tube for 16 hours out of the 24:

Casilan	80 g.
Glucose	250 g.
Arachis oil (emulsified with acacia)	150 ml.
Ascorbic acid	100 mg.
Water to	3000 ml.

This mixture provided 2600 calories and 70 g. of protein, but no sodium or potassium salts, which were added in a known amount as required. The patients were also given a litre of water to drink in the 24 hours, making the total intake 4 litres per day.

On the day of operation and until they could be allowed to take 4 litres of fluid a day by mouth, the patients were given continuous intravenous fluids—5% glucose, normal saline, and in certain cases (group 3 below) 0·375% potassium chloride or a mixture of potassium phosphates. Oral fluids gradually replaced intravenous in the usual way, the preoperative feeding being resumed by the 4th or 5th day; during this transition it was impossible to maintain a fixed water intake, but this was never allowed to fall below 4 litres in 24 hours. Apart from the blood given at operation the daily electrolyte intake was accurately maintained as follows:

Group 1.—In cases 1–8 160–170 m.eq. of sodium chloride (about 10 g.) was given throughout. In 1 other (case 9) this level was halved.

Group 2.—In cases 10–13 no sodium was given from the day of operation onwards.

Group 3.—Cases 14–20 received 160–170 m.eq. (about 10 g.) of sodium chloride and 100 m.eq. of potassium. On the day of operation this potassium intake was halved because of the reduced urine volume.

1 patient (case 21) undergoing herniorrhaphy was fed by mouth throughout, the diet containing approximately 85 m.eq. of sodium chloride (5 g.) per day. All patients (cases 1–20), save this last one, also received 500 ml. citrated blood during the operation, giving them an extra 60 m.eq. of sodium, 5 m.eq. of potassium, and 35 m.eq. of chloride in that period.

The volume, specific gravity, and sodium and chloride concentrations of pooled 24-hour urine specimens were estimated, and in some cases the nitrogen, uric acid, and creatinine. The sodium, chloride, and nitrogen content of pooled specimens of gastric juice, removed by routine aspiration, were also estimated. In some cases, during the first 2 hours of each period, 10 ml. of venous blood was drawn into a heparin tube for the following estimations: plasma-proteins, by the method of Phillips et al. (1950); plasma-chloride, by the Volhard-Harvey method; plasma-sodium, by the method of Albanese and Lein (1948) as modified by Chalmers et al. (1951); and eosinophils (Randolph 1949).

The following methods were used for urinary determinations: nitrogen, micro-Kjeldahl digestion and nesslerisation; creatinine and uric acid, King's (1951) modifications of Folin's method and of Benedict and Franke's method respectively. A flame-photometer was used for some of the later estimations of sodium and potassium.

These patients passed almost no fæces on this régime. On the 3rd morning postoperatively a small glycerin enema was

TABLE I—DATA FROM ALL CASES WEIGHED ON THE MORNING AFTER OPERATION, ILLUSTRATING PRIMARY WATER RETENTION AND EARLY SODIUM RETENTION

Case no.	Body-weight (lb.)			Weight gain 0 to 0+1		Urine vol. (ml.)		Urine sp. gr.			Urine Na conc. (m.eq. per litre)		Urine Na excr. (m.eq.)	
	0−1	0	0+1	Lb.	Kg.	0−1	0	0−1	0	0+1	0−1	0	0−1	0
2	125·3	125·8	130·9	5·1	2·3	3430	975	1·003	1·021	1·009	41	78	143	55
3	154·0	153·1	156·8	3·7	1·7	2530	950	1·002	1·013	1·007	35	50	89	47
4	103·3	102·8	107·4	4·6	2·1	2700	1290	1·003	1·013	1·005	17	72	66	93
5	122·6	122·4	126·0	3·6	1·6	2680	890	1·005	1·019	1·005	67	98	180	87
7	129·3	129·6	134·3	4·7	2·1	4310	560	1·005	1·023	1·007	50	149	215	83
10	196·0	195·6	197·4	1·8	0·8	3660	1674	1·007	1·011	1·006	47	60	172	100
11	128·1	127·6	132·1	4·5	2·0	3240	1000	1·005	1·018	1·009	57	79	185	79
14	148·8	148·4	151·3	2·9	1·3	3700	740	1·003	1·025	1·004	43	80	159	59
15	96·5	96·5	99·4	2·9	1·3	3180	1075	1·004	1·013	1·005	60	107	190	114
16	168·1	168·4	170·9	2·5	1·1	2730	1105	1·009	1·016	1·005	81	72	218	80
17	120·3	120·5	125·4	4·9	2·2	3850	1150	1·005	1·019	1·001	36	68	140	79
18	126·9	124·2	126·4	2·2	1·0	3535	1880	1·003	1·013	1·014	53	66	187	124
19	131·0	130·5	133·2	2·7	1·2	2750	1300	1·005	1·016	1·005	59	87	162	112
20	127·1	126·4	129·4	3·0	1·4	3090	1450	1·006	1·013	1·003	55	62	165	90
21	179·3	179·7	182·1	2·4	1·1	1550	690	1·009	1·020	1·008	31	56	50	38

given, usually producing a stool of 150–200 g. with a very low electrolyte content. Fæcal losses were therefore ignored. As no patient was febrile, except for a short time after operation, sodium and chloride losses in sweat were also ignored. In calculating the balances 30 m.eq. was considered a reasonable allowance for losses of sodium and chloride in the operating-theatre.

Nearly all the patients were weighed every day, always in the first 2 hours of the period, with the bladder empty, by the same observer using the same scales (Avery, model 1064). Observations could easily be made to within 4 oz., as shown by multiple readings. The weight of the dressings (a strip of gauze and plaster) was negligible. While on intravenous fluids the patients received no protein and not more than 600 calories in 24 hours (glucose 150 g.): during this time, therefore, they would be expected to lose about 1 lb. in weight and some 30 m.eq. of sodium per 24 hours (Gamble 1951).

Results

Our results show that three separable phases of retention can be recognised after operation. We have named these: primary water retention; early sodium retention; late sodium retention.

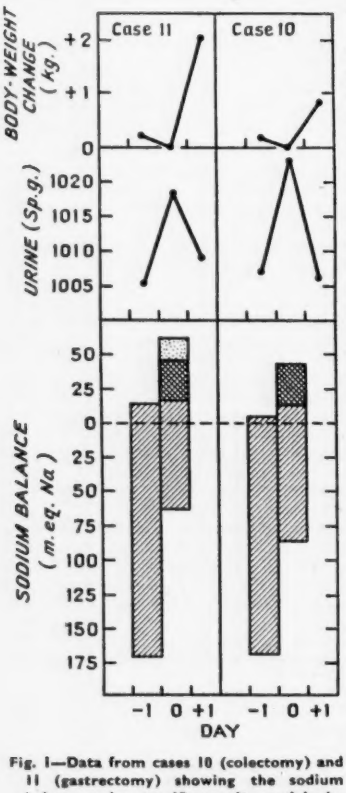

Fig. 1—Data from cases 10 (colectomy) and 11 (gastrectomy) showing the sodium balance, urine specific gravity, and body-weight. In all cases intake is plotted downwards from the base-line. Output is plotted upwards from the intake, so that a negative balance shows above the line and a positive below it. Despite a negative sodium balance on the day of operation these patients showed the weight-gain of primary water retention.

URINE
GASTRIC SUCTION
ALLOWANCE FOR SODIUM LOSS DURING OPERATION

Key to figs 1, 3, 4, and 5.

Primary Water Retention

15 patients were weighed on the morning after operation. Every one showed a gain in weight of 1·8–5·1 lb. (0·8–2·3 kg.), the average being 3·3 lb. (1·5 kg.) (see table I). This occurred when the calorie intake in the 24 hours was less than 600 calories, was accompanied by oliguria with a raised specific gravity (see table I); it can only have been due to water retention, which was never less than 1 litre. This water retention is not due to gastrectomy in itself, nor to the change from oral to intravenous fluids, as cases 10 and 21 show. These 2 patients underwent respectively colectomy and herniorrhaphy, the latter receiving oral fluids throughout; yet both showed water retention with characteristic urine changes.

In 4 patients (cases 10–13) no sodium was given on the day of operation (save for that in a bottle of citrated blood). The data from cases 10 and 11 are summarised in fig. 1, which shows that the weight-gain and high urinary specific gravity occurred despite a negative sodium balance. It is evident, therefore, that water retention is the primary event. This is confirmed by the changes in the plasma-protein and electrolyte concentrations, which indicate dilution of the blood and extracellular fluid on the day after operation (table II).

TABLE II—AVAILABLE FIGURES SHOWING BLOOD CHEMISTRY CHANGES DURING THE 24 HOURS AFTER OPERATION

Case no.	Plasma Na (m.eq. per litre)		Plasma Cl (m.eq. per litre)		Plasma-proteins (g. per 100 ml.)	
	0	0+1	0	0+1	0	0+1
2	158	146	112	103	7·2	6·1
3	144	146	104	99	6·5	6·8
4	155	140	102	94	6·8	6·1
5	..	..	109	102	7·2	6·7
7	142	138	110	105	6·8	6·1
9	150	138	102	100	6·5	6·1
10	144	144	100	99	6·3	6·2
11	144	136	107	94	6·7	6·1
14	152	144	106	101	7·2	7·0
15	144	136	100	94	6·7	6·7
16	146	142	102	96	7·0	6·7
18	142	142	95	90	6·3	5·9
21	138	132	103	103	6·8	6·8

In case 10 (colectomy) urine samples were obtained 4-hourly from the indwelling catheter. The detailed information obtained is summarised in fig. 2, showing that for nearly 24 hours the urine flow was reduced, with high specific gravity and chloride concentration. These are the characteristic effects of the release of antidiuretic hormone, and we know of no other physiological mechanism that produces such a result. In only 2 patients (cases 1 and 18) was this action prolonged into the second postoperative period; in all the others, on that day, the urine specific gravity was below 1·010, and there was an increased volume of urine of low sodium and chloride concentrations. In many cases there was at the same time a loss of part or all of the weight gained by water retention on the day of operation, though in some this was masked by further salt and water retention.

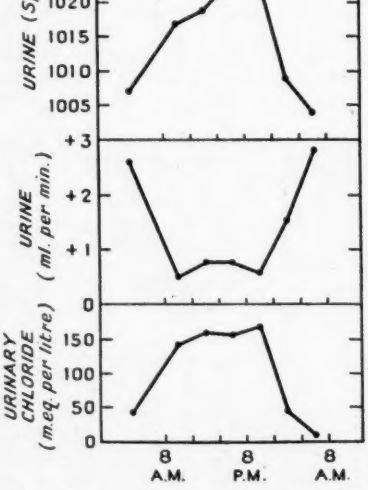

Fig. 2—Data from case 10. The first observations were made on the pooled 24-hour specimen for the day preceding operation; thereafter 4-hourly specimens were examined. The results show the prolonged fall in urine volume, and the rise in specific gravity and chloride concentration.

Early Sodium Retention

The 17 patients given sodium during the day of operation all showed a positive balance for that period. Leaving aside cases 9 and 21, with a lower intake, the range for the others was 70–186 m.eq. (average 105). In some cases part or all of this retained sodium was excreted the next day (fig. 3).

Coinciding as it does with water retention, this early sodium retention is accompanied by a urine of high

specific gravity and sodium concentration (fig. 3), these findings being reversed on the second day. A high urinary sodium concentration therefore coincides with a low sodium excretion on the day of operation, while a low urinary sodium concentration may occur with a high excretion on the next day.

Late Sodium Retention

As well as this early retention, there was a later, more prolonged, period of sodium retention characterised by positive sodium balance, low urine sodium concentration, and water retention with corresponding weight changes. This began on 0+1 or 0+2, and therefore might be either separated from the early sodium retention or, masking the excretion on 0+1, might coalesce with this early phase. It might be maximal on any of the first few postoperative days, and its duration was variable. These variations are illustrated by cases 7, 5, and 1 (fig. 3). It will be seen that in cases 5 and 1 there was continuous postoperative salt and water retention, owing to the coalescence of three separate events.

That this later retention is primarily one of sodium and not of water is shown by fig. 4, illustrating the data from case 13, in which the patient received no sodium for 4 days after operation. Here the weight fell steadily as the result of the low calorie intake, despite the fact that as much water was given as in the other cases.

INFLUENCE OF POTASSIUM INTAKE

The effect of giving potassium can be seen by comparing the results in cases 14–20, where this ion was given as described, with those in cases 1–9 where none was given.

Reference to table I shows that "primary water retention" occurred in both groups, though it was slightly less in the group receiving potassium. Applying the "t" test of significance of the difference between the means of small samples (Fisher 1946), $n=10$; $t=2{\cdot}873$; $P<0{\cdot}05$, suggesting that the difference between the two groups is significant.

Potassium deficiency has been shown to cause sodium retention (Black and Milne 1952), but our observations on other cases (to be published later) show that the time of this retention is variable. Presumably this was the cause of the preoperative sodium retention in cases 3 and 4, but postoperative retention occurred whether or not potassium was given. "Early sodium retention" occurred in both groups, the average being 95 m.eq. in the group receiving potassium as against 122 m.eq. in the other. Applying the same test as above, $n=12$; $t=1{\cdot}74$; $P>0{\cdot}05$. Even if no allowance were made for loss of sodium on the operating-table, P is still greater than 0·05.

"Late sodium retention" was the only one of the three phases which was greatly modified by giving

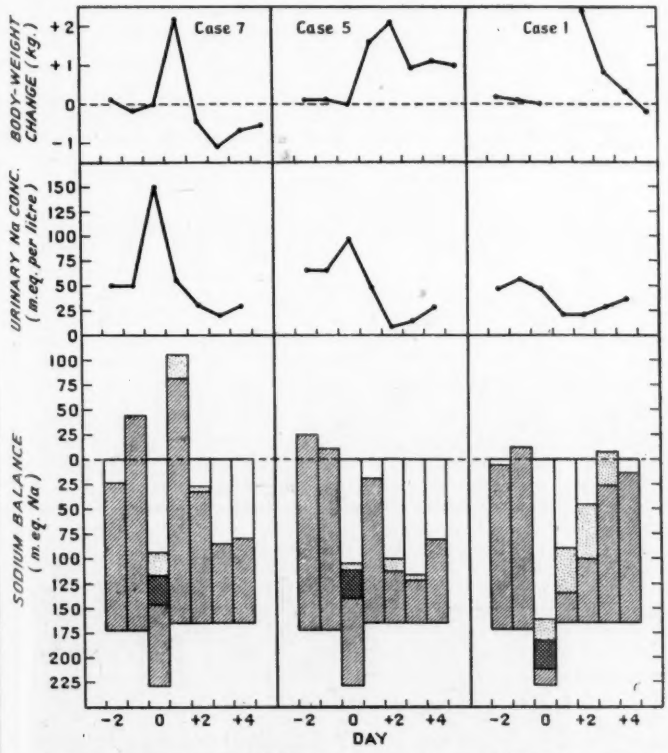

Fig. 3—Sodium balances and weight-changes in cases 7, 5, and 1: in all three cases the weight is adjusted to zero on the morning of operation. In case 7 early and late sodium retention are clearly separated, in case 5 they are distinct, whereas in case 1 they have coalesced.

Primary water retention and that secondary to late sodium retention are reflected in the weight-changes. In a 5-day period on an intake of only 100 g. glucose the normal subject loses nearly 200 m.eq. sodium (Gamble 1951). The urinary sodium excretions on the day of operation and the day after it are the reverse of what might be expected from the urinary concentrations, owing to primary water retention followed by water excretion.

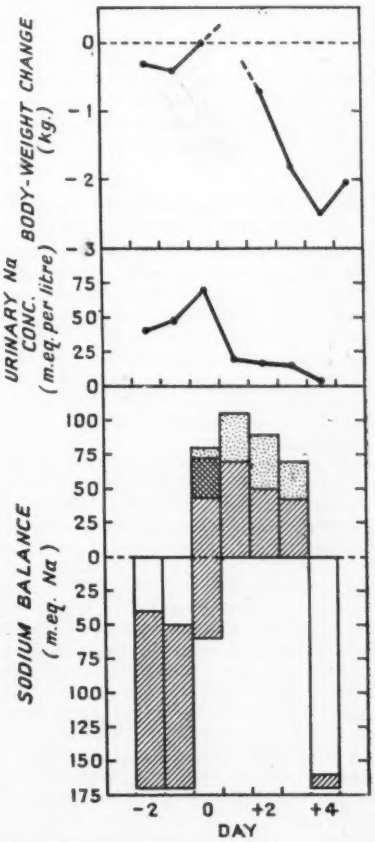

Fig. 4—Full data in case 13, in which no sodium was given after operation apart from that in a blood-transfusion. Although the water intake was maintained throughout at 4 litres per day the weight fell steadily, showing that water is not retained after the first 24 hours in the absence of sodium retention (cf. fig. 1).

TABLE III—DETAILS OF LATE SODIUM RETENTION. FOR DEFINITION OF "COALESCENT," "DISTINCT," AND "SEPARATED" SEE FIG. 4

Case no.	Morning on which body-weight finally fell below preop. level	Days of positive Na balance, with low urine Na conc.	Relationship between early and late Na retention
1	After 0 +4	0 +1, 0 +2	Coalescent
2	0 +3	0 +1	Coalescent
3	After 0 +6	0 +1, 0 +2, 0 +3, 0 +4, 0 +5	Coalescent
4	0 +4	0 +2, 0 +3	Separated
5	0 +6	0 +2, 0 +3, 0 +4, 0 +5	Distinct
6	0 +6	0 +2, 0 +3	Distinct
7	After 0 +5	0 +2, 0 +3, 0 +4	Separated
8	After 0 +5	0 +2, 0 +3, 0 +4, 0 +5	Separated
9	After 0 +6	0 +3, 0 +4, 0 +5	Separated
14	0 +2	0 +2, 0 +3, 0 +4	Separated
15	0 +6	0 +2, 0 +3, 0 +4, 0 +5	Separated
16	0 +3	Nil	Separated
17	0 +3	Nil	Separated
18	0 +3	0 +1, 0 +2, 0 +3, 0 +4	Coalescent
19	0 +4	0 +2	Separated
20	0 +4	0 +1, 0 +2	Coalescent

potassium; then it was less both in degree and duration, and coalescence with the early sodium retention occurred less often (table III). Typical cases are illustrated in fig. 5.

Potassium excretion studies were not carried out, save in case 20; this man was in positive potassium balance during every period except the day of operation, when the typical increased potassium excretion took place.

CHLORIDE BALANCES

A positive sodium balance was always accompanied by a positive chloride balance of the same order, but the latter was sometimes the greater for no obvious reason. Urinary chloride concentrations paralleled those of sodium.

EOSINOPHIL-COUNTS AND THE RATIO OF URINARY URIC ACID TO CREATININE

Daily eosinophil-counts were done on 10 patients. All showed a pronounced fall to about zero immediately after operation, but the rate of return to normal was very variable and bore no relation to sodium retention. Urinary uric-acid creatinine ratios were estimated in the early cases only; they showed similar, but reversed, changes to those of the eosinophils (fig. 6).

NITROGEN BALANCE

Nitrogen balances were studied in 6 cases: all showed the usual negative balance after operation.

Discussion

Many workers have noted the urinary and plasma changes occurring after operation, in association with water and salt retention. Continuous balance studies, with a fixed intake before and after operation, enable the whole phenomenon to be more exactly defined and have shown that it results from the fusion of three clearly separable events—namely, primary water retention, early sodium retention, and late sodium retention. Depending on the relationship of these last two, the retention of salt and water after operation may be continuous or interrupted.

Most of the earlier work dealt with the postoperative retention of saline. However, it was clearly shown by Cooper et al. (1949) that immediately after operation there is retention of water, with a urine of high specific gravity. This was also described by Moyer et al. (1949), and by Ariel (1951) who also recorded the resultant weight-gain. None of these workers, however, clearly defined the duration of this retention or the part it played in the whole. Our own results show that primary water retention is independent of sodium retention and is rarely maintained after the first 24 hours; only in cases 1 and 18 did it last longer. The dilution of the extracellular fluid resulting from this retention has been noted by many observers, in particular by Zimmerman (1951). Stressing that the oliguria occurred at the same time as the fall in the eosinophil-count, Hardy (1950) suggested that its origin was adrenocortical. There is no reason to suppose, however, that these events are causally connected. Indeed, the characteristic features of primary water retention (oliguria with high specific gravity and electrolyte concentration) are not the effects of a release of cortical hormones, but of the antidiuretic hormone; and we believe that this is in fact the cause of this water retention.

That antidiuretic hormone is released as the result of anæsthesia was suggested by Burnett et al. (1949). Ariel and Miller (1950) thought that this might occur during abdominal operations. Habif et al. (1951) considered that morphine and pethidine reduced the urine flow by stimulating the release of this hormone. Moyer et al. (1949) thought that all these factors might be responsible for the reduction in urine volume. There is evidence that emotional and other stimuli may be potentiated by morphine to produce a prolonged release of antidiuretic hormone (Lewis et al. 1952).

The normal stimulus to a release of this hormone is a rise in the osmotic pressure of the plasma (Verney 1946), and it is possible that this may occur in some cases in the operating-theatre. However, in case 20 care was taken to give intravenous glucose throughout at such a rate as to preclude this. The release of antidiuretic hormone

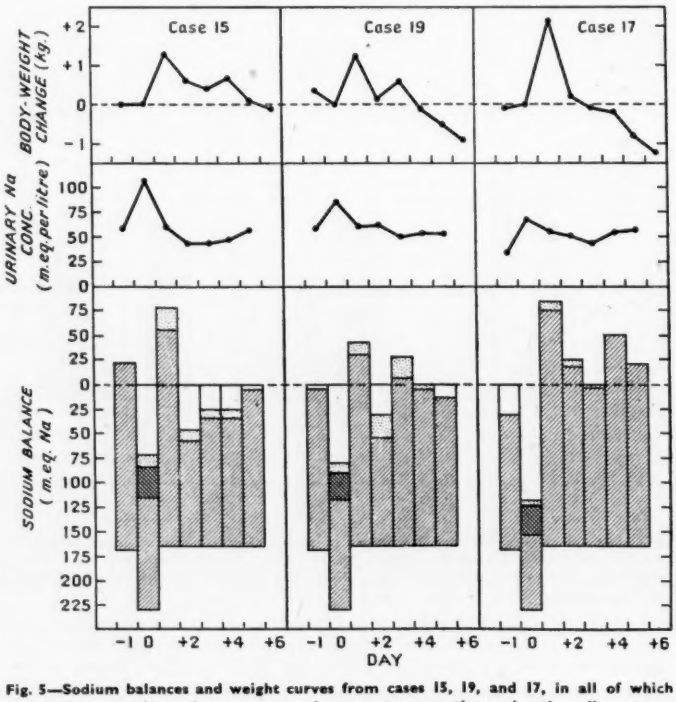

Fig. 5—Sodium balances and weight curves from cases 15, 19, and 17, in all of which potassium was given. In every case primary water retention and early sodium retention are clearly seen. In none of the cases is late sodium retention marked, and coalescence is not seen (cf. fig. 3).

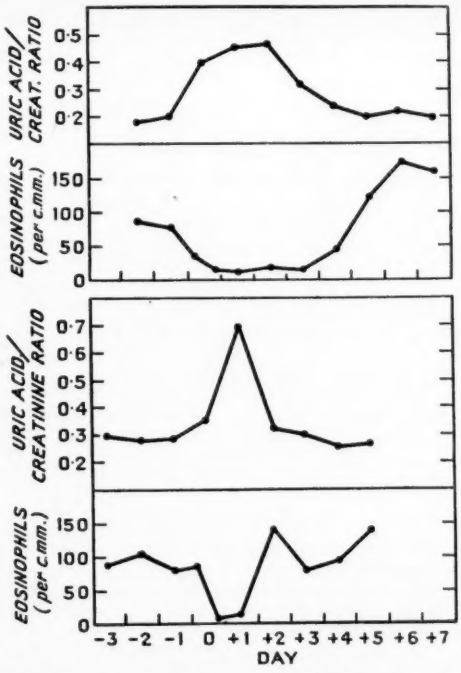

Fig. 6—Eosinophil-count and urinary uric-acid/creatinine ratio in 2 cases undergoing gastrectomy. The characteristic fall of eosinophils on the day of operation is shown; but the return to normal was most variable, and bore no apparent relation to the extent or duration of sodium retention. The uric-acid/creatinine ratio showed reversed but similar changes.

was no less prolonged than in other cases, thus showing that hypertonicity is not the essential factor. Morphine, anæsthesia, trauma, and emotion are probably the important stimuli.

The postoperative retention of salt has often been investigated. In 1944 Coller et al. clearly stressed the danger of giving too much salt in this period, and reported 5 cases made œdematous in this way. Wilkinson et al. (1949) related the sodium retention to the postoperative nitrogen loss, and suggested that both were parts of a complex reaction to trauma—an aspect which has been studied in great detail by Moore and Ball (1952). Search of published work has not disclosed any description of two separable episodes of sodium retention, though some published balance studies, particularly those of Howard and Mason (1946), show both to have occurred. Indeed, it is possible to distinguish in their studies examples of all three patterns of sodium retention that we have described (separated, distinct, and coalescent retention).

The evidence that postoperative sodium retention is largely adrenocortical in origin is considerable (Moore and Ball 1952). In particular, the increased excretion of potassium and nitrogen, the fall in circulating eosinophils, the rise in the uric-acid/creatinine ratio, and the increased urinary excretion of glycogenic corticoids are all consistent with this hypothesis. Since our results show that sodium retention often occurs in two phases, some modification of this hypothesis appears necessary.

It is possible that the hypotonicity resulting from water retention during the early part of the day of operation stimulates sodium retention later in this period, and so causes the early sodium retention. But Holland and Stead (1951) have shown that hypotonicity induced after pitressin injection does not cause sodium retention. Hæmodynamic factors may be largely responsible for early sodium retention. Coller et al. (1943) have shown that the glomerular filtration-rate falls during anæsthesia, and this in itself will reduce the sodium excretion (Chalmers et al. 1952). But the glomerular filtration-rate rapidly returns to normal after operation (Habif et al. 1951, Ariel and Miller 1950), and the period of depression may not therefore account for more than a part of the retention observed. Moreover, the excretion of potassium which has been shown to take place on the day of operation is one of the most characteristic features of the onset of adrenal stimulation (Bartter and Fourman 1951), and it is difficult to believe that the latter plays no part in causing this sodium retention. It therefore seems likely that early sodium retention is due in part to hæmodynamic factors and in part to adrenocortical release.

Late sodium retention occurs at a time when the sweat sodium concentration is falling (Johnson et al. 1950); and this again is known to result from the salt-retaining action of corticoids, suggesting that the late retention is cortical in origin. If, then, cortical release is partly or wholely responsible for both periods of sodium retention, it is difficult to see why they should ever be separated by a day of negative balance. The most likely explanation appears to be that the adrenal salt-retaining mechanism becomes fully effective only after a day or two, and that the early sodium retention is largely due to other factors. The whole postoperative disturbance of salt and water metabolism is probably due to three factors—namely, a release of antidiuretic hormone, renal hæmodynamic factors, and adrenocortical release; during the first 48 hours after operation the effect of the last is overshadowed by that of the first two, but becomes clearly apparent thereafter.

As mentioned above, potassium deficiency by itself can cause sodium retention, and there is little doubt that this has been partly responsible for the postoperative retention observed by many previous workers. However, potassium deficiency is not the main cause of postoperative sodium retention; it merely augments it.

It is possible that the period of relative starvation following operation might in itself cause sodium retention. Newburgh (1942) found that some cases of obesity failed to lose weight initially when put on a low-calorie intake, and suggested that salt and water retention was responsible for this. However, this only occurred in some cases; and Duncan et al. (1948), who gave a salt mixture to 2 patients during starvation, observed a negative sodium balance under these circumstances.

It is not clear whether the water and sodium are retained in the extracellular or intracellular compartment. Our data are insufficient to allow calculation of the exact amount of water retained; but a reasonable estimate could be made in many cases, and in all of these correlation with the sodium balance suggested that the retention of both was largely extracellular. Moreover, the fact that the chloride retention was usually greater than that of sodium also suggests that the retention was in the extracellular space. Indeed this discrepancy between the sodium and chloride balances even suggests that there may be a shift of sodium from the intracellular to the extracellular compartment. This hypothesis—that there is a considerable enlargement of the extracellular space after operation—is consistent with the findings of Lyon et al. (1949) and of other workers that the thiocyanate space is greater at this time. In addition, Levitt and Bader (1951) have shown that the administration of either A.C.T.H. or cortisone leads to an enlargement of the extracellular fluid volume, with a shift of sodium from the cells.

There are important practical applications of this work, which will be discussed in detail elsewhere. In planning the postoperative intake it must be borne in mind that the patient's ability to excrete salt is greatly reduced in this period, and that there is a similar inability to excrete water during the first 24 hours after operation.

Further, during this period observations of the urine specific gravity and electrolyte concentration may be misleading guides to the control of salt and water intake. A moderate intake of potassium should be ensured, particularly if intravenous fluids are to be given continuously for many days.

Summary

Postoperative changes in the excretion of water and electrolytes were studied in 21 patients maintained on an almost constant intake and weighed daily.

On this intake, three distinct changes were found:

1. Primary water retention in the first 24 hours.
2. Early sodium retention, also in the first 24 hours.
3. Late sodium retention, starting 24–48 hours after operation; this may last several days.

These three phases may combine to produce continuous postoperative sodium and water retention.

Potassium deficiency influences greatly only the third phase, which it enhances.

The possible causes for these phases are discussed. The first appears to result from a release of antidiuretic hormone due, not to changes in the plasma-electrolyte levels, but to stimuli such as emotion, trauma, and drugs. Adrenocortical release is probably responsible in part or whole for both episodes of sodium retention, though renal hæmodynamic factors probably contribute to the early retention.

Our thanks are due to Prof. P. B. Ascroft and Prof. A. Kekwick for providing facilities for this work, and to them and Dr. H. L. Marriott for their encouragement. Mr. G. L. S. Pawan, B.SC., and Mr. M. Phillips provided valuable technical assistance; and our thanks are also due to Sister P. B. Rees and members of the nursing staff for supervision of the patients. This work was done during the tenure of the Saltwell Research Scholarship of the Royal College of Physicians by one of us (A. A. G. L.)

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TUBERCULOSIS IN YOUNG CHILDREN

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IN a study of the mortality from tuberculosis among children on Tyneside (Cammock and Miller 1951) we drew attention to a significant fall in death-rates between 1938 and 1949—a continuous fall as regards school-children, but more particularly since 1947 for children aged 1–5 years. We claimed that studies of mortality are insufficient, and local studies of morbidity are required, for the understanding of the natural history of primary tuberculosis in children. We report here such a study designed to measure the morbidity of primary tuberculosis, especially the risk of tuberculous meningitis or miliary tuberculosis, in children infected before the age of 5 years. The question is fundamental, for these complications are the major immediate hazards of the primary infection, and half the cases still have a fatal outcome.

METHOD

The question can only be answered under certain well-defined conditions:

(1) A population must be observed and an accurate estimate made of the number of children acquiring primary infection during the period of observation.

(2) The population must be such that all cases of tuberculous meningitis and miliary tuberculosis are likely to reach hospital.

(3) All sources of information must be accessible—hospital outpatient and inpatient records, contact clinics for young children, chest clinics, and notifications.

In Newcastle we can fulfil these criteria. Conditions of medical practice are such that very few cases of serious tuberculosis are likely to pass unobserved, and any child ill and undiagnosed longer than a week is likely to be seen in hospital or by consultation at home. All the hospitals admitting Newcastle children are situated within the city. We were given complete access to all information. Finally, we have been able to use data from a morbidity survey in progress since 1947, to estimate the tuberculin conversion-rates at each year of age from birth to 5 years, and therefore the number of children undergoing conversion in the period of observation.

The population whose experience of tuberculosis we have traced consists of all children born in Newcastle between Jan. 1, 1945, and Dec. 31, 1949—i.e., all those who were or would have been aged less than 5 years on Dec. 31, 1949—about 25,000 children. The data of this experience were collected by careful and detailed research of all records, in hospitals and chest clinics and contact clinics, to the end of December, 1951.

In all, 258 children were traced, and these children and their illnesses have been set against the background of the number of children in the population who had acquired primary infection in the five years.

The reliability of the estimate of conversion-rates is essential to the validity of the study and is considered in detail.

ESTIMATE OF RATES OF TUBERCULIN CONVERSION

Since June, 1947, the department of child health and the city health department have been engaged on a clinical survey of a representative sample of the infant population of the city. Nearly 1000 families with infants born in May and June, 1947, have been observed and their illnesses recorded. As part of the observation,

* Part during the tenure of a Luccock Fellowship, and part with a grant from King's College Students Rag Appeal Fund, 1950. The data have been included in a thesis submitted for the degree of M.D. in the University of London.

TABLE I—TUBERCULIN CONVERSIONS IN NEWCASTLE CHILDREN 1947–52

Age of children	No. tested	No. of conversions	Total	Increase in each round (%)
15 months	960	17	17 (1·8%)	1·8
3 years	900	30	47 (5·1%)	3·3
4 years	810	13	60 (6·7%)	1·6
5 years	800	6	66 (7·5%)	0·7

routine tuberculin testing has been done with Old Tuberculin jelly, followed in doubtful results by an intradermal test of 10 T.U. of Old Tuberculin. The results of these tests (table I) show a conversion-rate of 1·8% at the age of 15 months, rising to 7·5% at that of 5 years. In table II the sample has been adjusted to the end of each year and the standard error of the percentage calculated.

The estimate of the number of children aged less than 5 years tuberculin-positive in Newcastle at any given time has been calculated in table III from a percentage calculated for the middle of each year. The range within which the true figure may fall is, however, considerable; and, though we give 1020 as an estimate, the variation may be anything from 720 to 1330. It is fair to say, however, that in Newcastle at present nearly 2% of the children have been infected by the end of their second year and between 7% and 8% at the end of their fifth year.

Our figure may be checked by the data published by the Medical Research Council (1952). In that report the children were all of school age attending State schools and not a sample of the population, and the tuberculin tests used were rather different—a modified flour-paper technique was used with tuberculin jelly as a first test, and as a second test 100 T.U. of Old Tuberculin was injected intradermally. These tests are both stronger than ours and may perhaps have given a positive reaction when the 10 T.U. or the application of Old Tuberculin jelly to the cleansed skin would not have

TABLE II—TUBERCULIN CONVERSIONS IN NEWCASTLE CHILDREN

Age of children (yr.)	Tuberculin-positive (%)	Standard error of percentage	Range ± 2 S.E.	
			Minimum	Maximum
1	1·4	0·4	0·2	2·2
2	3·2	0·6	2·0	4·4
3	5·1	0·7	3·6	6·6
4	6·7	0·9	5·0	8·4
5	7·5	0·9	5·7	9·3

done so. In the two areas nearest to Newcastle, Durham (Stanley U.D.) had 10·6% positive reactors in the sixth year, and Leeds 9·8%. From Hull Hardy (1950) has reported that, in a tuberculin survey of 4000 children aged 5–15, 10% were positive at the age of 5 years. He does not, however, state the composition of the group examined or the test used. Parkes (1952), using a flour-paper technique, found in Wolverhampton during 1950 6·3% positive in 2923 school entrants tested with jelly.

We therefore consider that our figure of conversion-rates based upon repeated testing of the same unselected sample of the infant population of the city gives a valid basis for our estimate that 4% of all children aged less than 5 years were infected—about 1020 in a population of 25,000 children.

MORTALITY AND MORBIDITY FROM TUBERCULOSIS

After a careful and thorough search of all records we traced 258 of the estimated number of 1020 children who had acquired primary infection with tuberculosis. Thus only 1 in 4 of the children were traceable at hospital or in tuberculosis contact clinic in a city where there is constant interest in childhood tuberculosis, all children in hospital have routine tuberculin tests, and all children aged less than 5 years who are in contact with a known case of tuberculosis in the family are carefully examined.

The 258 children were found through the following sources: 98 notified cases, 21 hospital cases not notified, 134 household contacts from observation clinics, and 5 other outpatients. In 201 we knew, and in another 30 cases could infer, the source of infection. All but 3 of the notified patients were in hospital, and it is unlikely that we would have missed children with recognised tuberculosis. Unless, therefore, which again is unlikely, a substantial number of children were ill and untraced, about 750 children passed through their primary infection in these five years either without illness or with so slight or temporary a disturbance of health that its nature remained undetected.

TABLE III—ESTIMATED NUMBER OF NEWCASTLE CHILDREN AGED LESS THAN FIVE YEARS TUBERCULIN-POSITIVE AT ONE TIME

Age (yr.)	No. of children	Positive at mid-point of year (%)	Estimate
0–2	10,000	1·6	160
2–3	5000	4·2	210
3–4	5000	5·9	295
4–5	5000	7·1	355
Total ..	25,000	4·1	1020

The 258 tuberculin-positive children comprised two very distinct groups: 117 admitted to hospital, most of whom were notified; and 141 who remained under outpatient supervision, few of whom were notified. More than half (170) of the 258 had been found tuberculin-positive during attendance at the contact clinics.

To the end of 1951, 39 of the 258 had died, 36 (14%) certainly from tuberculosis, and in the remaining 3 there was a strong presumption of tuberculosis. In all the fatal cases, except 4 caused by progressive primary lung lesions, the immediate cause of death was either tuberculous meningitis or miliary tuberculosis. When considering this mortality we should remember that 1949 was the first year in which streptomycin was generally available and B.C.G. vaccination started. Today this mortality of 3·5% within two years would be lower but not by more than half, and even with streptomycin available the present mortality-rate would be about 2% of children infected at less than 5 years of age.

The lesions found in the 258 children are set out in table IV, but the numbers under the various headings are obviously not of equal value or importance. Whereas we are not likely to have missed more than one or two, if indeed any, cases of miliary spread, meningitis, or bone disease, there must have been many cases of "fever of onset," temporary ill health, or failure to gain weight or loss of weight, and perhaps a few of conjunctivitis, wheezing, or even "silent" pleural effusion in young children who did not reach the hospital outpatients or

TABLE IV—LESIONS PRESENT IN 258 TUBERCULIN-POSITIVE CHILDREN AGED LESS THAN 5 YEARS

—	No. of cases
No evidence other than positive skin test	55
Primary lesions (clinical or radiological evidence): Chest 180, abdomen 6, cervical glands 15, skin 2 ..	203
Sensitivity manifestations: Erythema nodosum 8, phlyctenular conjunctivitis 10, pleural effusion 4	22
Progressive chest lesions	8
Bone and joint lesions (including 4 cases developing after tuberculous meningitis or miliary tuberculosis)	16
Miliary tuberculosis	23
Tuberculous meningitis	35
16 children had both miliary tuberculosis and tuberculous meningitis, making 42 children affected	

wards. Thus, we do not consider the number of children with "sensitivity" manifestations as any accurate indication of the real number of cases. Clinical or radiological evidence of the primary infection was present at some time in 80% of the children traced.

But we do think that the number of cases of miliary dissemination, bone disease, or meningitis is likely to reflect the risk of these complications in the children infected at the age of less than 5 years. Thus in 1020 infected children 16 (1·5%) developed bone lesions (4 of these after treatment for either tuberculous meningitis or miliary tuberculosis) and 42 (4·1%) meningitis or miliary tuberculosis or both, within a minimal period of observation of two years. If the possible range is calculated, we find that the risk is 1–2% for bone disease and 2·9–5·5% for either tuberculous meningitis or miliary tuberculosis. We would have liked to be able to take our data further and to calculate the risk in children infected before and after the age of 2 years. Certainly 31 of the 42 cases of miliary tuberculosis or of tuberculous meningitis occurred in children infected before the age of 2 years, but we did not know if the remaining 11 had been infected before or after their second birthday. If we assumed that all the 11 had been infected afterwards, the calculated risks of the development of tuberculous meningitis or miliary were 1 in 20 at the age of less than 2 years and 1 in 30 at the age of more than 2 years, but this difference was not statistically significant.

COMMENT

The chances of developing bone lesions, miliary tuberculosis, or tuberculous meningitis are the greatest hazards following the primary infection with tuberculosis. It is therefore important that these risks should be measured, and we can only assume that they are not well known because the conditions for their measurement are difficult to obtain.

All writers on childhood tuberculosis are agreed that the risk of illness is greatest with infection in the first year of life, remains high until the age of 2 or 3 years, and then diminishes. Authors who have followed large series of children infected in the first year or two presenting in hospital clinics or outpatient departments have found a varying mortality, usually about 10–20% of children within five years (Bernard et al. 1925, Asserson 1927, Myers and Kernkamp 1930, Wallgren 1938, Brailey 1940). In the Luebeck disaster, which combined heavy oral infection with extremely young age, there was a mortality of 36% (72 from 251) within a year.

None of these investigations, however, represents the risk of development of these lesions in all children infected in a given population under natural conditions. We have only been able to find one estimate similar in method to ours. Holmdahl (1950), in a follow-up designed to study the prognosis in children who had erythema nodosum at the time of primary infection, found that in children aged less than 7 years there was a 2·9% chance of the development of either tuberculous meningitis or miliary tuberculosis within a year of infection, and 3·8% within two years. After two years the risk did not increase.

It does appear, therefore, that primary infection with tuberculosis in children aged less than 5 years carries a risk of the development of serious complications of about 3–5%. This risk is probably not the same for all children aged less than 5 years and is likely to vary with age at infection, and possibly with other factors, such as genetic resistance, with repeated exposures or the development of other infections. As yet we have not the data to make any numerical estimate of these factors.

SUMMARY

The known rate of conversion in a group of children representative of the childhood population of a city has been used to estimate the number of primary infections in children aged less than 5 years.

4% of all children aged less than 5 years were infected —1020 from a population of 25,000.

We traced 258 of these children and found that, within a minimum of two years from infection, 16 (1·5%) had developed lesions of bone and 42 (4·1%) had developed either tuberculous meningitis or miliary tuberculosis; and that 36 (3·5%) had died of tuberculosis.

We wish to thank all our friends, and acknowledge the great help we have received in this study, particularly from the chest physicians of the clinics in Newcastle, and the medical staffs of the children's hospitals.

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INFLUENCE OF CARBOHYDRATE METABOLISM ON BACTERIAL ALLERGY

ITS RELATION TO CORTISONE DESENSITISATION

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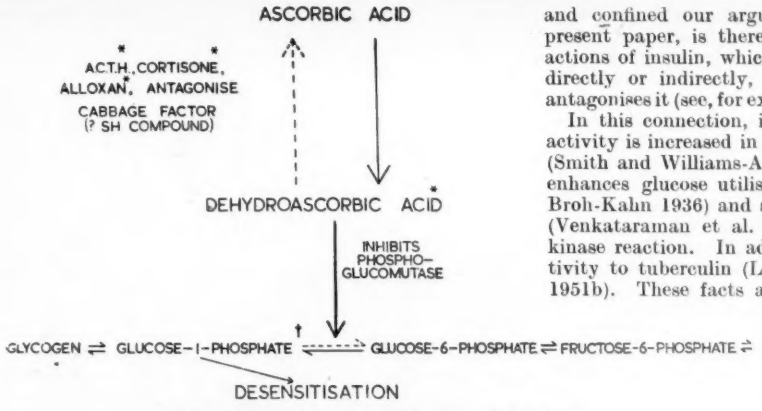
HYPERSENSITIVITY to streptococcal allergens, ascorbic-acid deficiency persisting into convalescence, and endocrine disturbance have all been suspected of playing significant parts in the pathogenesis of rheumatic fever. Based on this broad analogy, a study has been made of bacterial allergy (as represented by sensitivity to tuberculin in B.C.G.-infected guineapigs), ascorbic-acid deficiency, and the effects of various hormones upon them (Long and Miles 1950, Long et al. 1951a, b, and c, Cornforth and Long 1952). The limitations of animal experiments in elucidating human pathology have been repeatedly stressed (Long 1951, 1952). Our present views, to which these limitations strictly apply, may be summarised as follows.

It has been postulated that, in B.C.G.-infected guineapigs, cortisone and alloxan facilitate the formation of dehydroascorbic acid (Long et al. 1951c), which, by inhibiting phosphoglucomutase, blocks the conversion of glucose-1-phosphate to glucose-6-phosphate—accumulation of glucose-1-phosphate being associated with diminished sensitivity to tuberculin (fig. 1) (Cornforth and Long 1952). Organic phosphates representing the various stages of carbohydrate metabolism were therefore tested empirically. Among these, adenosine diphosphate (A.D.P.) was shown to have marked desensitising activity, whereas in comparable doses the closely related adenosine triphosphate (A.T.P.) had none (Cornforth and Long 1952).

It is known that the breakdown of glycogen in the tissues (leading in the first stage to glucose-1-phosphate) is sensitive to the equilibrium between A.T.P. and A.D.P., and to the availability of inorganic phosphate. This has been emphasised by Potter (1944), who says: "It must be recognised that there is a basal rate of A.T.P. breakdown which is balanced by the resting metabolism, and that glycogen may be expected to break down only when there is a sudden shift in the A.T.P./A.D.P. balance." These observations refer to intracellular metabolism, but it is possible that such arguments based on intracellular physiology may apply in the tuberculin-sensitive



* Desensitising action prevented by reduced glutathione.
† Desensitising action not prevented by reduced glutathione.

Fig. 1.

guineapig to the actions of metabolites injected extracellularly; that the extracellular injection of A.D.P. may cause glycogen to be converted to glucose-1-phosphate and so diminish sensitivity; and that the simultaneous extracellular injection of A.T.P. and A.D.P., by preventing a shift in the A.T.P./A.D.P. balance, may prevent desensitisation.

In the present paper we show that, as the ratio of extracellularly injected A.T.P. to A.D.P. is increased, the desensitising action of A.D.P. is first diminished and then abolished; in addition, injected A.T.P. inhibits the desensitising action of alloxan, cortisone, and dehydroascorbic acid, but not that of glucose-1-phosphate. These facts are consistent with our hypothesis; for if A.T.P. has inhibited glycogen breakdown, blocking phosphoglucomutase will not increase the concentration in the tissues of glucose-1-phosphate. On the other hand, the concentration, and therefore the desensitising action, of injected glucose-1-phosphate will be independent of these factors. Thus the results we expected on the basis of intracellular metabolism were achieved. It seems more probable that these organic phosphates, injected extracellularly into tuberculin-sensitive guineapigs, influence normal intracellular carbohydrate metabolism than that they produce a hypothetical series of pharmacological coincidences associated with like effects. Glucose-1-phosphate is a normal metabolite, but its rôle as intermediate in an important biological process may mean that, unless the balance of the process is appropriately disturbed, it is never free from the enzyme complex; so even minute quantities introduced from outside may produce an effect out of proportion to the total amounts involved in glycogen metabolism. It is possible that cell permeability is increased in guineapigs undergoing a severe tuberculin response, and that the argument holds only for this condition. However, we conclude that in B.C.G.-infected guineapigs, glycogenolysis (glycogen breakdown), with resulting glucose-1-phosphate formation, is associated with diminished sensitivity to tuberculin; that injected A.T.P., by stimulating glucolysis (glucose breakdown) and inhibiting glycogenolysis, antagonises this action and so prevents desensitisation; and therefore, that hexokinase hyperactivity and hypersensitivity on the one hand, and hexokinase hypoactivity and desensitisation on the other hand, are associated phenomena.

Fortunately, the actions of certain hormones upon carbohydrate metabolism in general, and upon hexokinase activity in particular, are not subject to the restrictions imposed by these problems of intracellular-extracellular relationship which have hitherto handicapped and confined our argument. The latter part of the present paper, is therefore devoted to a study of the actions of insulin, which stimulates hexokinase activity directly or indirectly, and of growth hormone, which antagonises it (see, for example, Wright 1952, Young 1948).

In this connection, it is noteworthy that hexokinase activity is increased in the tissues of thyrotoxic animals (Smith and Williams-Ashman 1951), and that thyroxine enhances glucose utilisation in the tissues (Mirsky and Broh-Kahn 1936) and stimulates the formation of A.T.P. (Venkataraman et al. 1950), which initiates the hexokinase reaction. In addition, thyroxine increases sensitivity to tuberculin (Long and Miles 1950, Long et al. 1951b). These facts are consistent with, and support, our present contentions.

The argument is strengthened by our findings (reported here) that growth hormone, which inhibits hexokinase activity, depresses sensitivity to tuberculin, whereas insulin, which stimulates hexokinase activity, antagonises the desensitising actions of cortisone, alloxan, and dehydroascorbic acid, but not of glucose-1-phosphate. Moreover, the compensatory phase that follows insulin hypoglycæmia—a phase for which the adrenal cortex is largely responsible (see, for example, Wright 1952)—is associated with desensitisation. As might be expected, this compensatory phase of desensitisation, like that produced by cortisone, does not occur in animals previously injected with reduced glutathione nor in ascorbic-acid-deficient guineapigs (cf. Long et al. 1951a and c). In addition, it can, like cortisone desensitisation, be prevented by injected A.T.P. In this connection, the observation of Kersley et al. (1951) that insulin hypoglycæmia is succeeded in rheumatoid arthritis by symptomatic relief comparable to that obtained with adrenocorticotrophic hormone (A.C.T.H.) is noteworthy.

From our experiments with organic phosphates and hormones, we conclude that sensitivity to tuberculin in B.C.G.-infected guineapigs depends on a balance between hexokinase-stimulating and hexokinase-depressing hormones, with the adrenal cortex controlling the metabolic process most intimately linked with sensitivity—namely, the concentration in the tissues of glucose-1-phosphate. Although part of the argument is based on results obtained with extracellularly injected carbohydrate metabolites, the remainder and major part is not subject to this limitation, and yet points to the same conclusions.

METHOD

Albino guineapigs of the Hampstead strain, weighing 350–550 g. and fed on a pelleted diet (Bruce and Parkes 1947) supplemented with unlimited cabbage, were injected with B.C.G. vaccine, and sensitivity to tuberculin was estimated by the method of Long and Miles (1950).

All drugs tested, except glutathione, growth hormone, cortisone acetate, and insulin, were dissolved in 1 ml. of normal saline and injected subcutaneously two hours before the tuberculin. Reduced glutathione was dissolved in gas-free distilled water and adjusted with sodium bicarbonate solution to pH 6; approximately 150 mg. per kg. body-weight, in a volume of 2 ml., was injected intraperitoneally two hours before the tuberculin. Cortisone acetate was suspended in 1 ml. of normal saline and injected six hours before the tuberculin. Growth hormone, partly dissolved, partly suspended, in 1 ml. of normal saline, was injected in the doses, and at the time-intervals, detailed in the experiments. Insulin was dissolved in 1 ml. of normal saline and injected subcutaneously at the time-intervals detailed in the experiments; the batch did not contain detectable quantities of hyperglycæmic factor. Animals treated with insulin received no food on the day of the experiment.

As in previous work, the diameter of the tuberculin lesions after twenty-four hours was found to be proportional to the logarithm of the dose of tuberculin; and it was possible to estimate the degree of sensitivity by the relative positions of the dosage-response lines fitted to the mean lesion-diameters plotted against the logarithm of the dose. Changes in sensitivity are measured in terms of the change in potency of standard doses of tuberculin compared with that in control animals. Thus a potency ratio of 0·25 indicates a fourfold decrease, of 4·00 a fourfold increase in sensitivity. The probability that ratios differing from unity indicate a significant change in sensitivity is expressed by the value of P in the tables. Ratios for which P is 0·05 or less are considered significant.

TABLE I—ANALYSIS OF RESULTS OF EXPERIMENTS

Expt.	Agent and dose per kg. body-weight	Variance ratio*	P	Potency ratio
1.	A.T.P. (10 mg.) + A.D.P. (2 mg.)	< 1	—	0·925
	A.T.P. (2 mg.) + A.D.P. (2 mg.)	27·59	< 0·001	0·464
	A.T.P. (1 mg.) + A.D.P. (2 mg.)	56·54	< 0·001	0·252
2.	A.T.P. (10 mg.)	< 1	—	1·09
	Alloxan (50 mg.)	75·05	< 0·001	0·423
	Alloxan (50 mg.) + A.T.P. (10 mg.)	< 1	—	0·912
	Cortisone acetate (5 mg.)	79·81	< 0·001	0·462
	Cortisone (5 mg.) + A.T.P. (10 mg.)	17·81	< 0·001	1·434
	Dehydroascorbic acid (50 mg.)	60·04	< 0·001	0·519
	Dehydroascorbic acid (50 mg.) + A.T.P. (10 mg.)	—	—	1·000
	Glucose-1-phosphate (0·01 mg.)	162·42	< 0·001	0·325
	Glucose-1-phosphate (0·01 mg.) + A.T.P. (10 mg.)	182·46	< 0·001	0·312
3.	Insulin (2 units) injected 0 hours before tuberculin	2·14	> 0·10	1·23
	Injected 2 hours before tuberculin	7·42	< 0·05	0·596
	Injected 4 hours before tuberculin	18·99	< 0·001	0·500
	Injected 6 hours before tuberculin	49·18	< 0·001	0·458
	Insulin (2 units) in ascorbic-acid-deficient guineapigs, injected 6 hours before tuberculin	5·03	> 0·05	1·445
	Insulin (2 units) injected 6 hours before tuberculin + reduced glutathione (150 mg.)	1·26	> 0·20	1·18
	Insulin (2 units) injected 6 hours before tuberculin + A.T.P. (10 mg.)	43·07	< 0·001	2·06
4.	Alloxan (50 mg.)	51·28	< 0·001	0·466
	Alloxan (50 mg.) + insulin (2 units)	< 1	—	1·182
	Cortisone acetate (5 mg.)	92·03	< 0·001	0·295
	Cortisone + insulin (2 units)	9·38	< 0·05	1·953
	Dehydroascorbic acid (50 mg.)	84·97	< 0·001	0·249
	Dehydroascorbic acid (50 mg.) + insulin (2 units)	< 1	—	1·034
	Glucose-1-phosphate (0·01 mg.)	53·02	< 0·001	0·366
	Glucose-1-phosphate (0·01 mg.) + insulin (2 units)	61·38	< 0·001	0·364
5.	Growth hormone (10 mg. per kg.) injected 0 hours before tuberculin	3·47	> 0·05	0·733
	Injected 3 hours before tuberculin	129·07	< 0·001	0·14
	Injected 9 hours before tuberculin	214·07	< 0·001	0·08
	Injected 12 hours before tuberculin	559·11	< 0·001	0·04
	Growth hormone (10 mg.) at 0 hours + cortisone acetate (5 mg.)	270·17	< 0·001	0·084†
	Cortisone acetate (5 mg.)	25·24	< 0·001	0·545
6.	Growth hormone (10 mg.) injected 6 hours before tuberculin	163·35	< 0·001	0·279
	Growth hormone (10 mg.) + A.T.P. (5 mg.)	111·09	< 0·001	0·346
	Growth hormone (10 mg.) + reduced glutathione (150 mg.)	171·94	< 0·001	0·287
	Growth hormone (10 mg.) + insulin (2 units)	81·52	< 0·001	0·332
	Growth hormone (10 mg.) in ascorbic-acid-deficient animals	51·82	< 0·001	0·253

* Ratios of "between treatments" variance to error variance.

† Cortisone acetate + growth hormone produced effects significantly greater than either alone. Alloxan + growth hormone also produced an effect significantly greater than either alone. These synergistic effects did not occur in ascorbic-acid-deficient guineapigs.

TABLE II—CONDITIONS IN WHICH DESENSITISATION DEVELOPED WITH THE AGENTS TESTED

Agent and dose per kg. body-weight	Normal diet	Ascorbic-acid deficient diet	Reduced glutathione (150 mg. per kg.)	A.T.P. (10 mg. per kg.)	Insulin (2 units per kg.)
Alloxan (25–50 mg.)	+	−	−	−*	−*
Cortisone acetate (5 mg.)	+	−	−	−*	−*
Dehydroascorbic acid (50 mg.)	+	−	−	−	−
Glucose-1-phosphate (0·01 mg.)	+	−	−	−	−
Growth hormone (10 mg.)	+	−	−	−	−
Insulin (2 units) (compensatory phase succeeding hypoglycæmia)	+	−	−	−*	..

\+ = desensitisation. − = no desensitisation.
* Sensitivity significantly *greater* than in controls.

RESULTS

Adenosine Triphosphate

The A.T.P. used in these experiments contained a small proportion of A.D.P. which was taken into account when calculating the amounts of the two substances.

The simultaneous injection of A.T.P. (1 mg. per kg. body-weight) and A.D.P. (2 mg. per kg.) caused a significant fourfold diminution in sensitivity; this effect was halved when the dose of A.T.P. was doubled, and abolished by a tenfold increase (experiment 1, table I). Thus, by increasing the ratio of A.T.P. to A.D.P., desensitisation was prevented.

The injection of A.T.P. (10 mg. per kg.) did not in itself influence sensitivity, but in cortisone-treated animals (5 mg. per kg.), it not only abolished but significantly increased sensitivity to tuberculin; however, it merely abolished the desensitising action of alloxan (50 mg. per kg.) and dehydroascorbic acid (50 mg. per kg.), and it did not influence that of glucose-1-phosphate (0·01 mg. per kg.) (experiment 2). These results, excluding the marked hypersensitivity in animals treated with both cortisone and A.T.P., had, as already stated, been expected. The explanation of these effects may perhaps be inferred by considering the mechanism by which A.T.P. may inhibit glycogen breakdown. Stimulation of the hexokinase reaction by A.T.P. leads to the disappearance of inorganic phosphate, fixed during the later oxidative stages of glucolysis. Cori and Cori (1940) showed that, when the ratio of inorganic phosphate to glucose-1-phosphate falls below a certain level, glycogen splitting (i.e., production of glucose-1-phosphate) ceases and glycogen synthesis occurs. The reason for the special effect of cortisone may be that (unlike alloxan or dehydroascorbic acid) it induces synthesis of glucose from protein. Fuel is thus provided for the hexokinase reaction and more inorganic phosphate disappears. Some of the glucose mobilised by cortisone is known to be converted through glucose-1-phosphate to glycogen; but in the special circumstances under discussion this should not cause accumulation of glucose-1-phosphate, the concentration of which would remain low so long as there was a shortage of inorganic phosphate.

Insulin

Insulin (2 units per kg. body-weight) injected at the same time as the tuberculin (0 hours) did not significantly influence sensitivity; but injected four or six hours beforehand, it markedly depressed sensitivity (experiment 3). This experiment was repeated and tuberculin sensitivity was plotted against blood-sugar levels (fig. 3): as hyperglycæmia succeeded hypoglycæmia, sensitivity

fell. This compensatory hyperglycæmic phase is attributable to hyperactivity of adrenal cortex and medulla (see, for example, Wright 1952), and consistent with this view, the desensitisation associated with it did not occur in guineapigs previously injected with reduced glutathione, or in ascorbic-deficient animals (experiment 3) (cf. Long et al. 1951a and b). It is noteworthy that, as in cortisone-treated animals, injected A.T.P. caused a significant increase in sensitivity (experiment 3) (table II).

The immediate effect of insulin, during the phase of hypoglycæmia, is shown consistently by a slight increase in sensitivity. In only one experiment was this increase statistically significant; the result given in experiment 3 is typical. Insulin, by stimulating hexokinase activity and increasing glycogen storage, might be expected, on the basis of our hypothesis, to antagonise desensitisation by cortisone, alloxan, and dehydroascorbic acid. Insulin is thought to stimulate phosphorylase and so promote the conversion of glucose-1-phosphate to glycogen (see, for example, Young 1948). Such an effect was not apparent in our experiments, extracellularly injected glucose-1-phosphate proving fully active in animals treated with insulin (experiment 4). Insulin prevented desensitisation by alloxan and dehydroascorbic acid, and significantly increased sensitivity in cortisone-treated animals (experiment 4) (table II).

Presumably this effect, like that of A.T.P. under similar conditions, is due to the hexokinase-stimulating activity of insulin, reinforced by glucose derived from protein under the influence of cortisone.

Growth Hormone

Growth hormone antagonises insulin and depresses hexokinase activity (see, for example, Young 1948). It proved a powerful desensitising agent in a dose of 10 mg. per kg. body-weight, increasing in effectiveness up to twelve hours, beyond which time it was not tested. In cabbage-fed but not in ascorbic-acid-deficient guineapigs, it had a synergistic action with cortisone and also alloxan (experiment 5). The desensitising action of growth hormone is not influenced by injected A.T.P., reduced glutathione, or insulin; or by ascorbic-acid deficiency in the diet (experiment 6) (table II), all of which, as already stated, prevent cortisone desensitisation. The experiments quoted here were carried out with a single large batch of growth hormone provided by Messrs. Armour; they were confirmed with a highly purified preparation provided by Prof. F. G. Young. This latter preparation, tested at eight hours, had approximately twice the desensitising potency of the Armour preparation, possibly owing to its greater solubility.

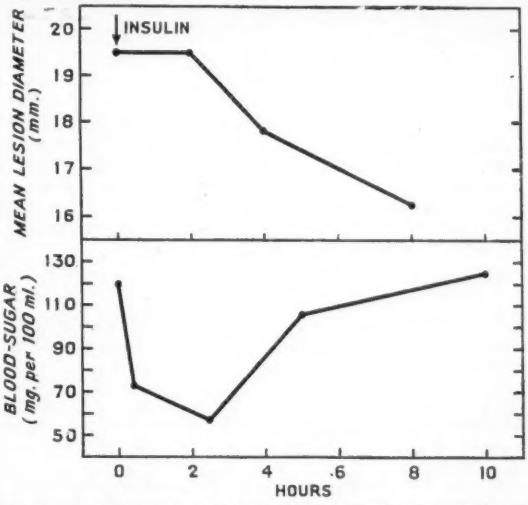


Fig. 3—Effect of insulin on blood-sugar level and tuberculin hypersensitivity.

DISCUSSION

The idea that insulin, the adrenal steroids, and growth hormone influence hexokinase activity is not new. The Coris suggested, on a basis of in-vitro experiments, that the adrenal steroids and the anterior pituitary inhibit hexokinase activity, and that insulin antagonises the actions of these hormones and so allows hexokinase activity to be resumed (Cori and Cori 1946, Colowick et al. 1947). But the Cori contentions are at variance with the facts. Excess of anterior pituitary and adrenocortical hormones are known to influence blood-sugar in a manner comparable to that associated with insulin deficiency. But insulin, which would be expected from the Cori hypothesis to be inactive in the hypophysectomised or adrenalectomised animal, shows instead enhanced activity. It seems improbable that adrenal steroids, in times of emergency, would stimulate the formation of glucose from protein, only to block its oxidation and moreover the oxidation of glucose from other sources. The idea that growth hormone inhibits hexokinase activity is more acceptable and does not depend only on in-vitro evidence. Growth hormone increases the formation of tissue protein, a process associated with a decrease in the amount of amino-acids in the blood and a decrease in nitrogen excretion in the urine; serum alkaline phosphatase and cell lipids are increased in amount, but reserve fat is decreased; calcium and phosphate retention are associated with growth of bone.

These build-up processes, particularly of protein, depend upon the maintenance of a normal level of blood-glucose. If this level falls, adrenal steroids facilitate protein conversion to glucose; thus growth hormone, by blocking hexokinase activity, would be expected to maintain the blood-sugar level, prevent protein breakdown, and assist growth. In the present paper, we show that the desensitising actions of growth

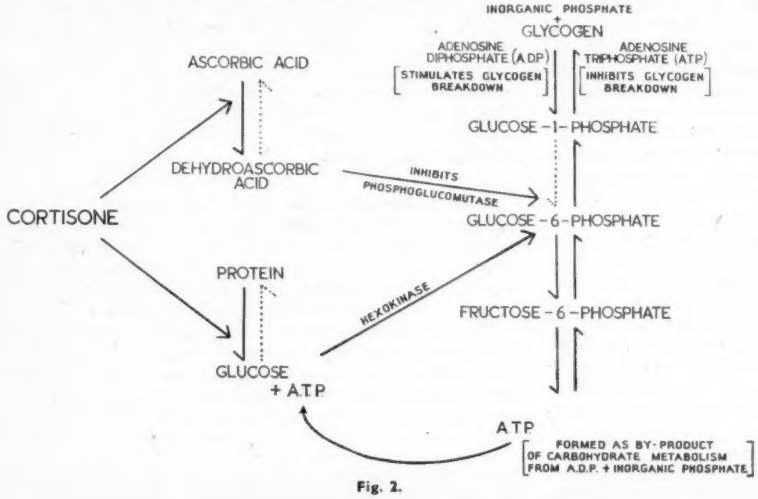


Fig. 2.

hormone and of cortisone are brought about by different and synergistic mechanisms. Their site of action is therefore likely to be different. We suggest that, in contrast to the action of cortisone, growth hormone blocks hexokinase activity, and that under its influence the body relies for its energy to a greater extent upon glycogen breakdown, associated with glucose-1-phosphate formation. This would explain the synergistic effect of growth hormone with both cortisone and alloxan, since blocking phosphoglucomutase in an animal which is breaking down glycogen will cause an accumulation of glucose-1-phosphate and also oppose A.T.P. formation.

SUMMARY

Using the response to intradermal tuberculin as a measure of allergic hypersensitivity in albino guineapigs injected with B.C.G., we find that:

(1) Single subcutaneous injections of adenosine diphosphate diminish sensitivity. This desensitising action is first diminished and then abolished by the simultaneous injection of increasing amounts of adenosine triphosphate.

(2) Single subcutaneous injections of adenosine triphosphate prevent desensitisation by alloxan, cortisone acetate, and dehydroascorbic acid. They do not influence desensitisation by glucose-1-phosphate.

(3) Single subcutaneous injections of adenosine triphosphate not only abolish desensitisation by cortisone acetate but actually increase hypersensitivity.

(4) Single subcutaneous injections of insulin do not in themselves significantly influence sensitivity. The compensatory phase that succeeds insulin hypoglycæmia is associated with desensitisation.

(5) The desensitisation that succeeds insulin hypoglycæmia is thought to be due to naturally liberated cortisone, since it does not occur in ascorbic-acid-deficient animals, is prevented by injection of reduced glutathione, and is intensified by injection of adenosine triphosphate.

(6) Single subcutaneous injections of insulin prevent desensitisation by alloxan and dehydroascorbic acid; they not only prevent desensitisation but intensify sensitivity in animals treated with cortisone acetate; and they are without effect on the desensitising action of glucose-1-phosphate.

(7) Single subcutaneous injections of growth hormone depress sensitivity to tuberculin. This action was unaffected under our experimental conditions by injection of reduced glutathione, A.T.P., or insulin, or by ascorbic-acid deficiency.

(8) In desensitisation, growth hormone (given in single subcutaneous injections) has a synergistic action with either cortisone acetate or alloxan.

Our present hypothesis (see fig. 2) provides a convenient summary of these facts. We have previously suggested that cortisone facilitates the oxidation of ascorbic acid to dehydroascorbic acid, which inactivates phosphoglucomutase, and thus blocks glycogen breakdown and increases the tissue concentration of glucose-1-phosphate—which is intimately concerned with desensitisation. We now suggest that adenosine triphosphate and insulin oppose this desensitisation by stimulating hexokinase activity, leading to a disappearance of inorganic phosphate which would otherwise be used for glucose-1-phosphate formation from glycogen. This effect is actually enhanced by the glucose formed from protein under the influence of cortisone, more glucose being thus provided for the hexokinase reaction.

The desensitisation produced by adenosine diphosphate and by growth hormone is ascribed to the effect of these substances in causing breakdown of glycogen to glucose-1-phosphate; with the hormone, at least, this effect is considered to be due to inhibition of hexokinase activity.

We are indebted to Dr. Knud Tolderlund of the State Serum Institute, Copenhagen, for the B.C.G.; to Messrs. Armour, of Chicago and London, for a generous gift of growth hormone; to Dr. A. Morrison, of Roche Products Ltd., Hertfordshire, for alloxan, dehydroascorbic acid, and reduced glutathione; to our colleague Dr. R. Porter for the insulin; and to Prof. F. G. Young, F.R.S., for some highly purified growth hormone.

We are greatly indebted to Miss M. V. Mussett for statistical analyses not only on the experiments described here but also on a large number of unquoted confirmatory experiments on which these observations are based.

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THE PREVENTION OF POSTOPERATIVE PULMONARY ATELECTASIS *

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IN the forty years since postoperative pulmonary atelectasis was recognised by William Pasteur at the Middlesex Hospital (Pasteur 1908, 1910) there has been little change in the incidence of this complication despite advances made in surgery and anæsthesia and the introduction of antibiotics.

The prevention and treatment of this condition is important because atelectatic areas readily become infected, leading to bronchopneumonia (Coryllos 1929, 1930).

Segmental atelectasis is the common postoperative pulmonary abnormality and it was found in 94% of patients who developed pulmonary complications after abdominal operations (Palmer 1952). It results from occlusion of the smaller bronchi by retained secretion and the absorption of air distal to the block (Coryllos 1929, 1930). The lesion is commonly basal and unilateral, but it may be bilateral and involve segments of the middle lobe or lingula (Palmer and Sellick 1952b).

We describe here a method for the prevention of postoperative atelectasis. It is based on the hypothesis that, if the factors which favour the retention of sputum in patients after operation can be overcome, atelectasis should seldom occur.

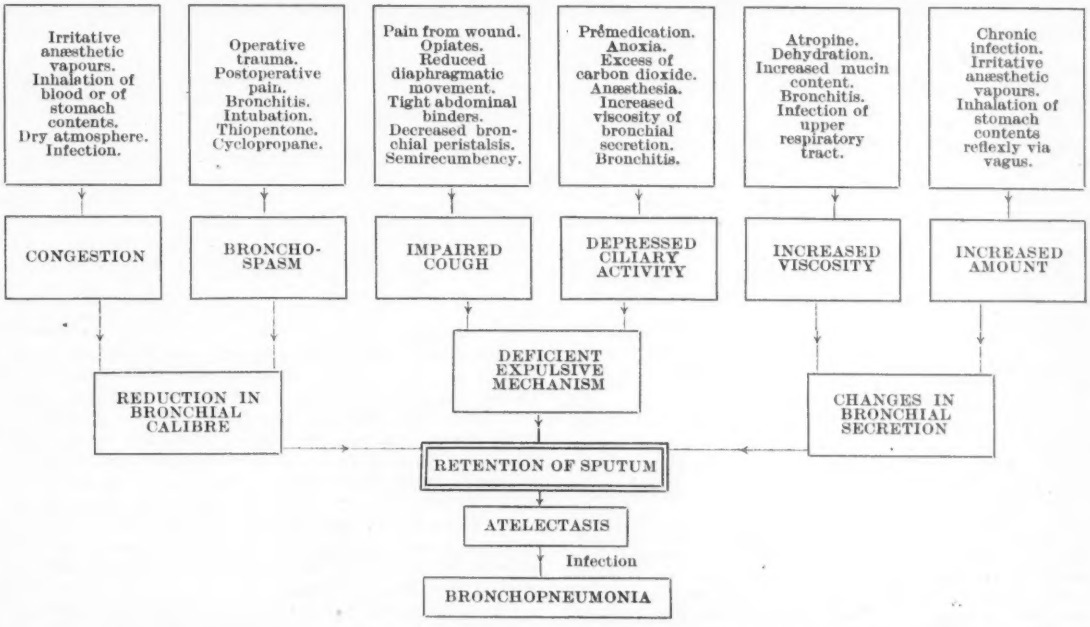
ÆTIOLOGY

Table I shows that the many factors concerned in the production of atelectasis ultimately have their effect by causing retention of sputum. We consider that a deficient expulsive mechanism, a reduction in bronchial calibre, and qualitative or quantitative changes in the bronchial secretion are all of great importance.

The cough reflex is the mechanism by which excess secretion is normally removed from the large bronchi (Ballon 1939, Bullowa 1944). After abdominal operations coughing is restricted owing to pain from the wound, and the cough is rendered weak and ineffective by the semirecumbent posture, impaired diaphragmatic move-

* Part of this work was included in a thesis for the degree of M.D. Camb. by one of us (K. N. V. P.).

TABLE I—FACTORS INVOLVED IN PRODUCTION OF POSTOPERATIVE ATELECTASIS


Irritative anæsthetic vapours. Inhalation of blood or of stomach contents. Dry atmosphere. Infection.
Operative trauma. Postoperative pain. Bronchitis. Intubation. Thiopentone. Cyclopropane.
Pain from wound. Opiates. Reduced diaphragmatic movement. Tight abdominal binders. Decreased bronchial peristalsis. Semirecumbency.
Prêmedication. Anoxia. Excess of carbon dioxide. Anæsthesia. Increased viscosity of bronchial secretion. Bronchitis.
Atropine. Dehydration. Increased mucin content. Bronchitis. Infection of upper respiratory tract.
Chronic infection. Irritative anæsthetic vapours. Inhalation of stomach contents reflexly via vagus.
CONGESTION
BRONCHO-SPASM
IMPAIRED COUGH
DEPRESSED CILIARY ACTIVITY
INCREASED VISCOSITY
INCREASED AMOUNT
DEFICIENT EXPULSIVE MECHANISM
REDUCTION IN BRONCHIAL CALIBRE
CHANGES IN BRONCHIAL SECRETION
RETENTION OF SPUTUM
ATELECTASIS
Infection
BRONCHOPNEUMONIA

ment (Muller et al. 1929, Howkins 1948), and the injudicious use of abdominal binders (Churchill and McNeil 1927). Opiates, moreover, reduce the desire to cough.

Secretion in the smaller bronchi is normally moved by the activity of the ciliated bronchial epithelium (Jackson and Jackson 1933, Boyd et al. 1943). Anæsthetics, lack of oxygen, excess of carbon dioxide, and increased viscosity of the bronchial secretion reduce ciliary activity (Hill 1928, Negus 1933), thereby favouring the retention of sputum in the smaller bronchi.

Congestion of the bronchial mucosa and bronchial spasm reduce bronchial calibre. Under these conditions very small amounts of secretion may produce bronchial occlusion and atelectasis. Bronchial spasm may occur in the induction period if an endotracheal tube is introduced into an insufficiently anæsthetised patient, and when anæsthetics such as cyclopropane (Rovenstine 1942) and barbiturates (Burstein and Rovenstine 1938) are used. It may be caused during the operation, through rough handling of the viscera and traction on the mesentery (De Takats et al. 1942), or after the operation if there is severe pain (Lucas 1950). Patients with chronic bronchitis are especially liable to develop bronchospasm after operation. Congestion of the bronchial mucosa may be produced by irritant anæsthetic vapours or by the aspiration of irritant material into the lungs. The inhalation of stomach contents may follow frank vomiting, but of greater danger is the silent regurgitation which may not be noticed until the mask is removed at the end of the operation (Culver et al. 1951).

The amount of bronchial secretion is increased by infection and irritation of the bronchi and by stimulation of the secretory glands of the bronchi reflexly via the vagus (Florey et al. 1932, De Takats et al. 1942). An increase in the viscosity of bronchial secretion resulting from dehydration, chronic bronchitis, or large doses of atropine (Thomas et al. 1938) or scopolamine (Hibma and Curreri 1942) is also an important factor in the production of atelectasis; for, when the viscosity of bronchial secretion is increased, secretion is not removed from the smaller bronchi by ciliary movement, or from the larger bronchi by coughing.

Thus, after operation, the normal mechanisms for the clearance of bronchial secretion are seriously impaired and changes in the bronchial secretion may take place. For these reasons sputum is retained in the lungs, leading to atelectasis.

Therefore the prevention of postoperative atelectasis depends essentially on preventing retention of sputum, and on recognising those cases in which this is especially likely.

We have found that the risk of a patient's developing atelectasis is high when one or more of the following factors is present:

(1) A history of even minimal bronchitis—e.g., recurrent productive winter cough.
(2) Clinical or radiological evidence of bronchitis.
(3) An infection of the upper respiratory tract in the 14 days preceding the operation.
(4) Abdominal operations, especially partial gastrectomy and cholecystectomy, and repair of inguinal hernia.

Thus atelectasis is particularly liable to develop in patients who, by reason of chronic infection or irritation of the bronchial tree, produce a viscid bronchial secretion. Smokers and elderly men are high-risk cases because they commonly have bronchitis, and those undergoing abdominal operations because they have most difficulty in expectorating secretion after operation.

METHODS

The present regimen was developed because the routine measures in this hospital—procaine penicillin and breathing exercises before and after operation—were failing to prevent postoperative atelectasis (Palmer and Sellick 1952a). The method we now adopt consists in (*a*) postural drainage with vibratory and clapping percussion and (*b*) inhalation of isoprenaline before and after operation. Isoprenaline has a powerful bronchodilator and vasoconstrictor action on the bronchial mucosa, and it is given to overcome the spasm and the congestion of the bronchi which are thought to be responsible for the rhonchi often heard after the opera-

tion in patients who develop atelectasis (Palmer and Sellick 1952b).

Preoperative Treatment

(1) Oral inhalation of 1 ml. of 1% solution of isoprenaline ('Neo-Epinine Solution No. 1,' Burroughs Wellcome & Co.) by means of a hand inhaler three times a day.

(2) This is followed by fifteen to twenty minutes' postural drainage. The foot of the bed is raised at least 18 in. with blocks or a metal stand. The treatment consists in clapping and vibration percussion to the chest wall, especially the basal regions, in the expiratory phase of respiration. This is done with the patient in the two lateral positions (side-lying) and prone. Five to ten minutes' treatment is given in each position. This treatment should be continued thrice daily until no sputum is produced when the patient is tipped.

Although patients may not confess to a productive cough, sputum is usually produced when they are tipped. Many patients with chronic bronchitis have been seen who produced two or three ounces of mucoid or mucopurulent sputum when tipped for the first time. After a week's treatment, no sputum was produced, the rhonchi disappeared, and the breathing was much easier. Severe cases of bronchitis may require fourteen days' preparation before the operation.

All cases should have 1 ml. of isoprenaline by inhalation and be tipped immediately before the preoperative injection. Very occasionally patients react to the isoprenaline with tachycardia, pallor, and restlessness. The first dose, therefore, should be given slowly. If there is a reaction, 0·25 ml. can usually be given without any side-effect. In emergency abdominal surgery postural drainage may be contra-indicated, but the patient should be given a full dose of isoprenaline by inhalation.

Postoperative Treatment

(1) As soon as consciousness is regained, the patient should be given an inhalation of 1 ml. of 1% isoprenaline, and this is repeated six-hourly.

(2) When his general condition permits (usually from six to twelve hours after operation) postural drainage is given six-hourly. If the prone position is not tolerated, the treatment should be given in both lateral positions.

Treatment is continued as long as sputum is produced on tipping. All patients should have at least five days' treatment, and it is essential that during the first twenty-four hours the treatment should be thorough. If there is clinical or radiological evidence of atelectasis, it should be given hourly. If the affected portion of the lung has not expanded clinically within twelve hours (shown by the return of normal breath sounds) bronchoscopy should be considered.

This regimen proved very satisfactory in a small number of high-risk cases in which the patients were not considered fit for operation because of the condition of the chest. It was therefore decided to test its efficiency in a controlled series of cases.

INVESTIGATIONS

An unselected consecutive series of 180 patients admitted for repair of inguinal hernia or for partial gastrectomy for peptic ulcer were divided into two groups with the help of tables of random numbers (Fisher and Yates 1938). These groups were treated as follows:

Group E: postural drainage and the inhalation of isoprenaline before and after operation (as described above).

Group O: breathing exercises before and after operation.

All the patients were given procaine penicillin 600,000 units b.d. before and after operation as a routine.

The sex-incidence and age-incidence and the number of smokers, bronchitics, and hernia cases were satisfactorily distributed in the groups (table II). Each patient was examined clinically before operation and thereafter daily. The clinical diagnosis of atelectasis is difficult during the first twenty-four hours after operation, when it is most likely to develop (Stringer 1947, Palmer 1952). We have, therefore, relied on radiological findings. X-ray films of the chest were taken before operation and, with a portable apparatus, after the operation. Minimal changes, such as prominence of the basal markings and slight elevation of the diaphragm, which have been reported as normal radiological findings after abdominal operations (Muller et al. 1929), were not considered to constitute any abnormality. Only unequivocal radiological evidence of atelectasis was accepted, and the films were reported on by the same radiologist, who did not know to which treatment group the patient belonged.

TABLE II—COMPARISON OF TWO GROUPS OF UNSELECTED PATIENTS

Group	No. of patients	No. with history of bronchitis	No. of smokers	No. of females	No. of hernia cases	Average age (yr.)
E	90	44	67	19	22	48 S.D. 12
O	90	39	59	13	24	47 S.D. 12
		$\chi^2 = 0{\cdot}56$ n = 1 P > 0·50 Not significant	$\chi^2 = 1{\cdot}69$ n = 1 P > 0·10 Not significant	$\chi^2 = 1{\cdot}46$ n = 1 P > 0·20 Not significant	$\chi = 1{\cdot}17$ n = 1 P > 0·20 Not significant	

Of the group E patients 8 (9%) showed radiological evidence (table III) of atelectasis, compared with 39 (43%) of group O. None of the patients in group E had a productive cough lasting a week or more after operation, whereas this was present in 30 (33%) of group O.

This regimen is clearly effective in preventing postoperative atelectasis. It is successful because it enables the patient to remove secretion from the lungs after the operation. In high-risk cases the amount of sputum is reduced by preoperative treatment.

Aronovitch (1945) and Scurr (1951), using a bronchodilator alone, reported good results in the prevention of atelectasis. If atelectasis could be prevented by using isoprenaline alone, the treatment would be simplified. An experiment was therefore undertaken to determine whether postural drainage with vibration and clapping percussion alone or isoprenaline by inhalation alone was effective in preventing atelectasis.

160 consecutive unselected patients undergoing an operation for the repair of inguinal hernia or for partial gastrectomy for chronic peptic ulcer were divided into four groups with the help of tables of random numbers (Fisher and Yates 1938). These groups were treated as follows:

Group 1: isoprenaline by inhalation alone before and after operation.

Group 2: isoprenaline and postural drainage and vibratory percussion as described above.

Group 3: postural drainage with vibratory and clapping percussion alone before and after operation.

Group 4: breathing exercises before and after operation.

All the patients were given procaine penicillin and were examined clinically and radiologically before and after operation as in the previous experiment.

Table IV shows that there was a satisfactory distribution of high-risk cases in the groups.

The outcome of this experiment (table V) confirms the result of the previous experiment that the low incidence of atelectasis in the group treated with isoprenaline and by the physiotherapy regimen together is unlikely to have arisen by chance ($P<0{\cdot}01$), but it provides no evidence that either the physiotherapy regimen alone or isoprenaline alone is more effective than breathing exercises in preventing atelectasis ($P>0{\cdot}50$).

DISCUSSION

Many factors are involved in the production of post-operative atelectasis (Band and Hall 1931, Brock 1936). We have grouped them together in table 1 to provide a better understanding of the way each acts in causing the retention of bronchial secretions.

We found that isoprenaline and postural drainage with vibratory and clapping percussion together prevented atelectasis, but that either singly was less effective.

We think this is because changes in bronchial calibre, a deficient expulsive mechanism, and changes in bronchial secretion are present in most high-risk patients after operation, and that, unless treatment is directed to the relief of these factors simultaneously, atelectasis is not prevented.

When the physiotherapy regimen (postural drainage and vibratory percussion) is given alone, secretion does not get to a part of the lung where the cough reflex is elicited, because spasm and congestion of the bronchi hold the secretion in the peripheral parts of the lung. When spasm and congestion of the bronchi are relieved by isoprenaline, secretion is brought to the larger bronchi when the patient is tipped, and it is removed by coughing.

Isoprenaline alone fails to prevent atelectasis, because, although spasm and congestion are relieved, secretion is not brought to the larger bronchi where coughing is effective in its removal.

This concept is supported clinically by the following case:

A man, aged 50, was admitted in April, 1952, for a partial gastrectomy for chronic duodenal ulcer. He was a heavy smoker and had chronic bronchitis and emphysema. He was treated before the operation with postural drainage and vibratory percussion, with improvement in the productive cough. This treatment was continued postoperatively, but little or no sputum was produced, and radiography of his chest twenty-four hours after the operation showed an area of atelectasis at the left base. There were generalised sonorous rhonchi and prolonged expiration. When the postural drainage and vibratory percussion were repeated after the inhalation of isoprenaline, 4 oz. of viscid mucoid sputum was produced, and the area of atelectasis expanded.

TABLE III—RESULTS OF TREATMENT OF TWO GROUPS OF UNSELECTED PATIENTS

Group	No. of patients	No. with segmental atelectasis	No. with productive cough for 1 week or more
E	90	8 (8·9%)	0
O	90	39 (43·3%)	30 = 33·3%
		$\chi^2 = 27·69$ n = 1 P <0·001 Significant	

Although all these main mechanisms operate in most cases, rarely one factor may be predominant. Atelectasis has been noted during operation (Cassells and Rapoport 1944), and the bronchoconstrictor and bronchosecretory reflexes described by De Takats are probably responsible. These reflexes may also explain those cases in which no occlusion of the bronchial lumen is found at necropsy.

TABLE V—COMPARISON OF RESULTS OF DIFFERENT TREATMENTS IN FOUR GROUPS OF UNSELECTED PATIENTS

Group no.	No. of patients	No. with segmental atelectasis
1	40	15
2	40	4
3	40	13
4	40	17
		$\chi^2 = 11·74$ n = 3 P <0·01 Significant

Bronchial secretion after operation is often extremely viscid. A reduction in viscosity of the bronchial secretion aids removal from the lungs by increasing ciliary activity. Isoprenaline renders the bronchial secretions more fluid in asthmatic patients (Gay and Long 1949), and we are undertaking experiments to determine whether isoprenaline reduces the viscosity of the bronchial secretion in patients after operation.

Baker et al. (1951) used intravenous sodium iodide twice daily to prevent atelectasis and reported successful results. Iodides increase bronchial secretion and reduce its viscosity (Basch et al. 1941), thereby facilitating expectoration. Atelectasis did not occur in any of 100 consecutive patients treated prophylactically before and after operation by this method, but the risk of atelectasis was not great in all these cases, for in 58 the operation did not involve laparotomy. Moreover, only severe degrees of atelectasis were considered.

We have found this treatment of value where the bronchial secretion is extremely viscid, but its routine use is not advised, for the copious secretion produced by sodium iodide may, in the presence of an ineffective cough reflex, lead to retention of sputum and atelectasis.

We favour the use of steam inhalations in conjunction with isoprenaline and postural drainage where the secretion is extremely viscid, because steam reduces the viscosity of the bronchial secretion (Basch et al. 1941) without increasing the amount.

SUMMARY

A deficient expulsive mechanism, reduction in bronchial calibre, and quantitative and qualitative changes in bronchial secretion are considered to be of great importance in leading to retention of sputum and the development of atelectasis in patients after operation.

A regimen for the prevention of postoperative atelectasis is described. This consists in the inhalation of isoprenaline and postural drainage with vibratory and clapping percussion to the chest wall before and after operation.

The incidence of atelectasis in 90 patients undergoing abdominal operations who were treated by this regimen was 9%, compared with 43% in 90 similar patients treated with breathing exercises before and after operation. All the patients received procaine penicillin before and after operation.

TABLE IV—COMPARISON OF FOUR DIFFERENT GROUPS OF UNSELECTED PATIENTS

Group no.	No. of patients	No. with history of bronchitis	No. of smokers	No. of females	No. of hernia cases	Average age (yr.)
1	40	19	32	4	11	49·3 S.D.13·3
2	40	20	29	7	14	48·8 S.D.10·9
3	40	22	34	6	15	51·1 S.D. 9·9
4	40	20	29	4	15	47·9 S.D.11·3
		$\chi^2 = 0·47$ n = 3 P >0·9 Not significant	$\chi^2 = 2·58$ n = 3 P >0·5 Not significant	$\chi^2 = 1·38$ n = 3 P >0·7 Not significant	$\chi^2 = 1·19$ n = 3 P >0·7 Not significant	

Either a bronchodilator—e.g., isoprenaline—alone or physiotherapy regimen (postural drainage and vibratory and clapping percussion) alone was not more effective than breathing exercises in reducing atelectasis in 160 patients undergoing operations for inguinal hernia or for partial gastrectomy.

It is concluded that postural drainage with vibratory and clapping percussion to the chest wall and a bronchodilator in combination are necessary for the prevention of postoperative atelectasis. The reasons for this are discussed.

We wish to thank the members of the research grants committee of the Middlesex Hospital, and the surgeons, anæsthetists, and members of the department of physical medicine for their coöperation; Dr. C. G. Whiteside for his reports on the X-ray films; Prof. Alan Kekwick for much help and encouragement; and Dr. John Friend for reading the manuscript.

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PRACTICAL PENICILLIN

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IT is hoped that this paper may do something to reduce the long stream of patients with minor sepsis entering the casualty departments of hospitals, shorten the time lost to the patient and the community by ill health, and be of practical help to general practitioners. It is written to show that procaine penicillin in aqueous suspension is a very serviceable weapon against acute infections.

Previously I showed (Cohen 1950) that 300,000 international units of procaine penicillin in aqueous suspension will almost always give an effective blood-penicillin level for twenty-four hours, and that a single daily injection of such a suspension has big advantages over the three-hourly injection of aqueous solutions of crystalline penicillin (soluble penicillin). From the literature it was clear that large doses of procaine penicillin in *oily* suspension could be given without ill effect (Thomas et al. 1951), and Cannon et al. (1951) stated that twice-weekly injections provided a very effective blood-penicillin level; but when these workers used an aqueous suspension they could not depend on an effective level after twenty-four hours. In my experience, however, this objection does not apply to the suspension now widely used. I have found that, after a single injection, penicillin is present in the blood for three or four days, and that this is a basis of sound treatment not only in the outpatient department of a hospital, but also, and particularly, in general practice.

TABLE I—RESULTS OF TREATMENT WITH 5 ML. OF PROCAINE-PENICILLIN AQUEOUS SUSPENSION IN HOSPITAL CASUALTY DEPARTMENT

Condition	No. of cases	Length of treatment (days)			No. incised	No. injected more than once	Reactions
		Ave.	Max.	Min.			
Abscess:							
Axillary ..	9 (4·5%)	7	13	2	4 (44·4%)		None
Breast ..	2 (1·0%)	8	8	8	2 (100%)		None
Cervical ..	4 (2·0%)	11	20	3		1	None
Face and scalp ..	8 (4·0%)	7	23	2	1 (12·5%)		None
Perianal ..	2 (1·0%)	5	5	4	1 (50%)		None
Boil ..	32 (16·0%)	7	33	2	5 (15·6%)	1	None
Burn ..	1 (0·5%)	2	2	2			None
Bursitis ..	7 (3·5%)	8	16	3	1 (14·3%)	1	None
Carbuncle	3 (1·5%)	8	10	7			None
Cellulitis ..	4 (2·0%)	12	28	3	2 (50%)	1	None
Sepsis:							
Arm ..	14 (7·0%)	7	16	2	2 (14·3%)	1	None
Dental ..	1 (0·5%)	4	4	4			None
Hand ..	83 (41·5%)	7	34	2	31 (37·4%)	2	None
Leg and foot ..	30 (15·0%)	7	13	2	5 (16·7%)	2	Allergy in 1 case
Total ..	200	..	..	..	54 (27%)	9	1 case

Long et al. (1950) have pointed out that, in using an antibiotic, the aim should be to bring the infection under control as quickly as possible, which necessitates adequate doses. This is especially important in the treatment of severe or fulminating infections. The same workers warn against overtreating the patient: when the infection is controlled, treatment should be discontinued. "Remember," they say, "in most instances the response should be prompt."

TREATMENT IN HOSPITAL CASUALTY DEPARTMENT

With these precepts in view, blood-penicillin levels were estimated at the intervals shown in fig. 1 after the administration of 1·5 mega-units of procaine penicillin in aqueous suspension; in these experiments 'Distaquaine Suspension' was used. The injection is one of 5 ml., but this volume can be given with little or no discomfort into the triceps or the gluteal region.

Having found an adequate blood-penicillin level three or four days after the injection of 1·5 mega-units

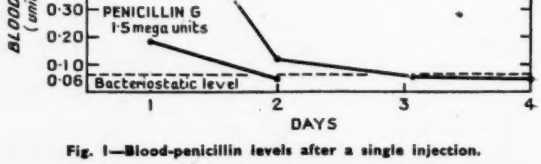

Fig. 1—Blood-penicillin levels after a single injection.

of distaquaine suspension, I instituted clinical trials. The casualty officer on duty saw the patients, and those whom he considered should have penicillin were given 5 ml. (1·5 mega-units) of distaquaine suspension, after which I followed them up in a re-dressing clinic. The cases, therefore, were not selected by me. Notes were taken of 200 consecutive cases. In most cases the dressings were paste of magnesium sulphate (*B.P.C.*) or saline solution for the open sepsis, and glycerin of ichthammol (*B.P.C.*) for the closed infections.

The results are shown in table I. In 191 cases one injection alone was required. Cure was effected in seven to ten days. In the remaining 9 cases a second injection was required and was given on the fourth day of treatment. When there is no improvement by the fourth day, the organisms are probably penicillin-resistant. This accords with the tenets of Long et al. (1950) that the response should be prompt. Further, I believe that this large dose of penicillin kills off or weakens the invading organisms in the first few days, while the patient's antibodies are being built up, with the result that, when the penicillin has disappeared on the fourth day, the patient's own defence mechanisms can dispose of any remaining infection.

The usual indications were followed in assessing the necessity for incision; these were made when required, in the belief that penicillin is given to help the surgeon and not to take his place.

To see whether 1·5 mega-units of crystalline sodium penicillin G (soluble penicillin) in aqueous solution would have the same effect, blood-penicillin levels were measured (fig. 1) after injecting it dissolved in 3 ml. of distilled water. It caused slightly more discomfort than did 5 ml. of the procaine-penicillin suspension. The blood-penicillin levels found suggested that excretion was slow enough to warrant a clinical trial; so 100 cases were treated with it, the same control being used as procaine penicillin. The results are shown in table II.

TABLE II—RESULTS OF TREATMENT WITH 1·5 MEGA-UNITS OF PENICILLIN G IN HOSPITAL CASUALTY DEPARTMENT

Condition	No. of cases	Length of treatment (days)			No. incised	No. injected more than once	Reactions
		Ave.	Max.	Min.			
Boil ..	7	8	15	3	2 (28·6%)		None
Burn ..	2	12	13	10			None
Sepsis:							
Arm ..	3	17	33	7	2 (66·7%)		None
Axillary	3	6	8	5	1 (33·3%)		None
Dental	1	7	7	7			None
Eye ..	1	7	7	7			None
Face ..	10	7	12	4	1 (10%)	2	None
Foot ..	3	10	17	6			None
Hand ..	59	9	27	2	21 (35·6%)	4	None
Leg ..	10	8	19	2		1	None
Perianal	1	4	4	4			None
Total..	100	..	..	..	27 (27%)	7	None

Although a similar proportion of cases required a further injection—7% for crystalline sodium penicillin G cases compared with 4·5% for procaine-penicillin suspension—the average time of treatment with crystalline sodium penicillin G was somewhat longer, and the disability during treatment rather more severe. Œdema did not settle so quickly, pain was not relieved so rapidly, and more attendances in the outpatient department were required.

With procaine-penicillin suspension little improvement other than the relief of pain was noted in the first twenty-four hours. During the next twenty-four hours the œdema subsided, and carbuncles that were open extruded a septic core on that day or the next; those that were not open began to diminish in size and redness, the inflammation appearing to subside by resolution.

TABLE III—RESULTS OF TREATMENT WITH 5 ML. PROCAINE-PENICILLIN AQUEOUS SUSPENSION IN GENERAL PRACTICE

Condition	No. of cases	Length of treatment (days)			No. incised	No. injected more than once	No. sent to hospital	Reactions
		Ave.	Max.	Min.				
Boil	20	4	7	3		1		None
Burn	1	2	2	2				None
Carbuncle ..	1	4	4	4				None
Chest	4	4	7	2				None
Pemphigus ..	1	2	2	2				None
Sinus	3	4	4	4				None
Tonsillitis ..	4	4	5	2				None
Sepsis:								
Axillary ..	1	11	11	11	1		1	None
Breast ..	1	12	12	12		1		None
Cellulitis ..	1	5	5	5				None
Dental ..	3	4	4	4				None
Ear	19	7	32	3		2		None
Eye	9	4	5	2				None
Face and neck	12	4	6	3				None
Hand ..	8	3	5	2	1			None
Leg	9	4	8	3				None
Perianal ..	3	5	6	5				None
Total ..	100	..	..	..	2	4	1	None

TREATMENT IN GENERAL PRACTICE

The treatment of patients reaching hospital having thus been shortened, investigation was transferred to general practice. It was hoped to treat patients on their first appeal for medical help. Through the courtesy of Dr. J. Sytner and his partners, I was privileged to attend evening surgery in a general practice until 100 cases had been discharged. This meant that 135 cases were treated, only 100 of these having reported back to be seen when cured.

Here again the choice of cases was left to others, this time to the general practitioners; and, as these attended in three consulting-rooms simultaneously in the same building, it was easy to control the cases without inconvenience to doctors or patients. This group practice is in probably the poorest part of Liverpool, the houses being overcrowded, with few amenities, and in bad repair from war damage. It was chosen for these very reasons, in the belief that this repository penicillin therapy should undergo a really stern test.

I injected 5 ml. (1·5 mega-units) of procaine-penicilllin suspension into patients over one year of age, and 2·5 ml. (750,000 I.U.) into those under one year (the youngest was aged eleven days). The dressings were lint soaked in "a teaspoonful of salt to a cup of water, warm but not hot." If the sepsis was closed, glycerin of ichthammol was applied. I believe that local penicillin is without efficacy; so no penicillin was applied locally. The results are shown in table III.

Out of the 135 patients seen only 2 required incision; 1 received the incision in hospital and was healed in eleven days, the other (a child, aged fourteen days,

TABLE IV—PERCENTAGE RATES OF CURE UP TO 10 DAYS

Treatment	Days							
	3	4	5	6	7	8	9	10
Hospital outpatient department:								
Procaine-penicillin suspension	16	26	43	52	61	72	75	80
Penicillin G	13	26	37	44	56	59	61	67
General practice:								
Procaine-penicillin suspension	23	68	91	93	94	95	..	..

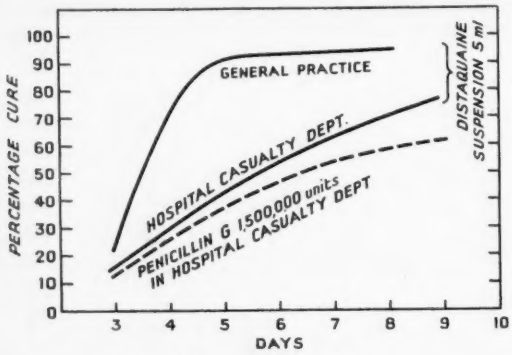

Fig. 2—Percentage rates of cure.

with a septic finger) had the finger opened with a needle in the surgery. All the other cases treated resolved without requiring the help of hospital treatment, and 91 of the 100 cases followed up were cured at the end of five days with one injection and salt-water dressing (see table IV).

The relief on the children's faces, when they were told one injection only would be required, was sufficient reward in itself. A large number of ear cases were treated. Some had been discharging for months; these dried up but required more than one injection. Single-injection therapy, as shown by tables I, II, and III, is not adequate in all cases. Should injections subsequent to the first be necessary they should be given every fourth day.

Fig. 2 and table IV show the day-by-day percentage cure in the three divisions of this trial.

COMMENT

The established facts show how important it is to begin treatment early, and it emphasises that the place to begin treatment is in general practice. It is better to give an unnecessary injection than to wait and see whether the infection will clear up without it.

When all clinical requirements are fulfilled, cost becomes important. The cost of this single-dose therapy compares favourably with that of the dressings, ointments, &c., so often prescribed for the types of infection treated in these trials. Of the utmost importance is the freeing of the casualty departments of busy general hospitals from the need to attend to many chronic and difficult infections. It is important to the nation that workers be able to return to work quickly after absences due to minor acute infections, but the social aspects of these trials need not be emphasised in what is essentially a clinical report.

SUMMARY

Trials showed that 1·5 mega-units of procaine penicillin in aqueous suspension would maintain an effective blood-penicillin level for three or four days, and that the same dose of crystalline sodium penicillin G (benzylpenicillin sodium salt) in aqueous solution was effective for twenty-four hours only.

Clinical trials showed that this dose of the aqueous suspension of the procaine salt was more effective in combating infection in the outpatient department of a general hospital than was a similar dose of crystalline sodium penicillin G in aqueous solution.

Moreover, a single injection of 1·5 mega-units of the procaine-penicillin aqueous suspension, given by the general practitioner when the patient was first seen, led to cure of 91 cases out of 100 by the fifth day. Only 1 case out of 135 required incision at hospital.

In addition to the facts that only 1 patient had to go to hospital and that only 1 patient's finger, that of a baby, had to be opened, the time factor should be considered. The patients are returned to work more quickly, and in some cases may altogether avoid "stopping off." Patients themselves can judge whether a septic lesion is getting worse, and they can be asked to report back if the necessity arises. The doctor's time is saved, for an injection of this type can be given in a couple of minutes.

My thanks are due to Mr. R. Kennon, Mr. J. B. Oldham, and Mr. S. V. Unsworth, surgeons of the United Liverpool Hospitals, on whose patients I have undertaken this work; to Dr. J. Sytner and his partners for allowing me the facilities of their general practice; to the Distillers Company (Biochemicals) Ltd., for the use of their laboratories and for the penicillin preparations used in this work; and to Mr. A. Grainger for his invaluable help in the laboratory.

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SIMULTANEOUS AORTIC AND AXILLARY EMBOLISM

SUCCESSFUL TREATMENT FOLLOWED BY MITRAL VALVOTOMY

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WE report this case because no similar successful multiple embolectomy seems to have been published, and no other case of similar ætiology seems to have been carried to a logical conclusion by subsequent valvotomy.

CASE-RECORD

Mrs. A, a thin, nervous, but coöperative housewife of 42, was admitted to the Norfolk and Norwich Hospital on Dec. 15, 1951, under the care of Dr. Branford Morgan, with congestive heart-failure complicating rheumatic mitral stenosis. She had been admitted several times previously for similar episodes. In 1945 she had had an embolic right hemiplegia, from which she gradually and almost completely recovered.

The present attack of failure was typical, with a conspicuous malar flush, rapid auricular fibrillation, and signs of mitral stenosis. Under medical treatment, including full digitalisation, she progressed well, and on Dec. 29 she was allowed up in a chair for the first time. On this day also she developed some nausea and vomiting, due probably to digitalis.

On Dec. 30 at about 11 A.M. sudden numbness came on in the left arm and leg, and shortly afterwards in the right leg also. There was little pain. Both lower limbs were pulseless from the groins down, and the left brachial and radial pulses were also absent. Sensation and movement of all three affected limbs were much impaired. Although cold and frightened, the patient was in fair general condition. Slow fibrillation was present. A diagnosis was made of multiple arterial embolism, arising from the fibrillating left auricle, and surgical help was obtained within thirty minutes of the onset of symptoms.

Operation

Operation was undertaken four hours after the first symptom appeared. The anæsthetic, given by Dr. B. G. Forrest, was thiopentone followed by nitrous oxide, oxygen, and minimal ether, with fractional doses of gallamine ('Flaxedil').

First, the inert and spastic femoral arteries were exposed in each groin and occluded with Crile clamps. Then, with the patient in the Trendelenburg position the abdomen was opened through a generous left lower paramedian incision. The aortic bifurcation and the few centimetres of trunk below

the origin of the inferior mesenteric artery were easily and quickly displayed by dissection of the pre-aortic peritoneum, sympathetic fibres, and areolar tissue. The vessel was pulsating normally to within 1 cm. of the bifurcation, below which point only transmitted thrust was palpable. Beyond, the common iliac arteries were pulseless. The aorta, clamped and taped proximally, was next incised vertically for about 1·5 cm. immediately above the bifurcation. Much thrombus was milked from each common iliac artery but was unfortunately not preserved. The free retrograde bleeding which followed was controlled by digital pressure while the aortic incision was being closed with interrupted mattress sutures of fine braided 'Nylon.'

When the aortic clamps were released, strong pulsation ensued in all the visible distal vessels except the left external iliac and femoral arteries. The left femoral artery was therefore opened, and a fine soft suction catheter was passed proximally. After this there was a faint left femoral impulse. A 2·5% solution of papaverine was applied to the exposed vessels, as recommended by Kinmonth (1952), and the wounds were closed, leaving fine 'Polythene' tubing down to the various arteries that had been handled.

As the patient's condition was still fairly satisfactory, the left axillary artery was exposed through a curved incision, concave downwards, on the front of the shoulder. The outer part of the clavicular head of the pectoralis major muscle was detached from the clavicle, and the muscle was divided near its brachial attachment. The pectoralis minor was cut through, the axillary sheath was opened, giving an extensive exposure of the artery. The level of cessation of pulsation was in the third part near the crossing of the medial root of the median nerve. The nerves were held aside on tapes, and much thrombus was milked from a 1 cm. vertical incision in the non-pulsating segment. The suction catheter was also used. Although free retrograde bleeding took place, no pulsation returned after the arterial incision was sutured, even after the application of papaverine. The wound was repaired in layers round a fine polythene tube.

The operation lasted about two hours.

Postoperative Course

The patient was nursed in an oxygen tent overnight. Papaverine was instilled at intervals through the polythene tubes. No anticoagulant was given. After causing some anxiety for the first few hours the patient improved, and recovery was uneventful apart from an episode on the 13th day, when abdominal pain and distension, with some shock appeared and lasted about 48 hours. The cause was uncertain but might have been intraperitoneal rupture of a small peri-aortic hæmatoma. No pulse could be felt at any time in any of the affected limbs, but their vitality was never in doubt.

Valvotomy

In view of her poor cardiac prognosis and the repeated embolism, Dr. Branford Morgan was of the opinion that valvotomy should be considered. Accordingly the patient was transferred on the 32nd postoperative day to the thoracic unit of St. Bartholomew's Hospital at Hill End, where on March 24, 1952, she underwent mitral valvotomy by Mr. O. S. Tubbs. We are indebted to Mr. Tubbs for permission to include extracts from his notes.

"The auricular appendage, which was large and broad, felt quite soft. The base of the appendage was injected with ¼% amethocaine and a Brock clamp applied. The incision in the appendage was made from above downwards with the escape of fluid blood. There was no clot inside the appendage and the endocardium appeared quite smooth. The clamp was momentarily released and no clot was discharged, only fluid blood. A purse-string suture was not employed as the appendage was so large. A finger was now inserted through the opening. There was no regurgitant stream palpable. An area of calcification in the anteromedial cusp was felt. There was some difficulty in finding the actual stoma as it was so small. The lateral commissure split easily, but the medial commissure could not be made to split. There did not appear to be any calcification at the margins of the opening. After the lateral commissurotomy the stoma would have admitted about one and a half fingers. The clamp was then reapplied, the tip of the appendage removed for section, and the opening obliterated with interrupted mattress sutures and continuous sutures along the border. The chest was closed with an intercostal drain in the posterior axillary line. The patient was returned to the ward and kept in an oxygen tent for the first 24 hours after operation. Her convalescence was smooth and she was discharged from hospital on April 17, 1952.

"*Pathological report.*—The specimen consists of an auricular appendage measuring 3 × 2 × 1 cm. and showing some slight subpericardial hæmorrhage, but otherwise no macroscopic abnormality. Section shows considerable hypertrophy of the muscle-fibres and some organising endocardial thrombus. In one area of the myocardium there is a focus of chronic inflammatory cells, mostly lymphocytes, but there are no specific rheumatic nodular lesions."

Follow-up

The patient was readmitted to the Norfolk and Norwich Hospital on May 2, 1952, looking an entirely different woman. The cyanotic malar flush was gone, as had the dyspnœa, and she could walk up and down stairs with ease. Apart from a flicker in the left radial artery, no pulsation was palpable in any of the affected limbs.

When last seen on Jan. 14, 1953, she had maintained her improvement, and had gained about 7 lb. in weight, felt better than for years, and could do her housework. She could climb stairs without breathlessness and could walk at least a mile at an ordinary pace without fatigue or claudication. She had some pain in the soles of her feet on walking; this took about two hours to pass off, and may have been structural rather than circulatory. The peripheral pulses were still absent, and the feet were cold, with very slight postural blanching.

The patient will remain under observation.

DISCUSSION

Operative Technique

In view of previous papers there is no need to discuss technique in detail. A few points, however, deserve mention—mainly steps which we now consider to have been errors committed in the atmosphere of unusual emergency.

1. It was almost certainly a mistake to expose and clamp the vessels in the groin before opening the abdomen. Our object was to avoid distal migration of portions of detached thrombus, but this danger is likely to be considerably less than that of spasm and intimal bruising caused by the clamping. Temporary occlusion of the common iliac vessels during extraction of the clot has been described by Linton (1945). If any doubt exists about the diagnosis of aortic saddle embolus, it may be correct to explore a femoral vessel first, as in the case described by Fraser and Goldberg (1951).

2. The use of suction tubes, however soft, is inadvisable. According to Linton (1945) gentle handling of tissues and avoidance of intimal injury are cardinal points of technique. External milking followed by momentarily unchecked bleeding should in most cases obviate the need for endarterial manipulations.

3. The arterial incision is probably best placed in the relatively dilated segment just above the point of impaction of the embolus. The contracted segment at and below that point is already sufficiently damaged and narrowed without having to suffer further insult. Failure to observe this point in the case of the axillary artery probably explains the non-return of pulsation in that vessel immediately after the embolectomy.

4. To the general surgeon, his familiarity with the simple transperitoneal approach, and the good exposure it affords, are invaluable when he is called on to tackle this unusual though not unduly difficult emergency (Linton 1945, Ewing 1950).

Effect of Embolectomy

In none of the affected limbs were normal peripheral pulses restored, although, as has been noted, strong pulsation returned in most of the major distal vessels after removal of the aortic clamp. The failure of the vascular tree to return to normal was probably due to a combination of spasm and thrombosis following overmanipulation of the vessels. Even so, it must be emphasised that they were by no means roughly handled; obviously extreme gentleness is required, together with avoidance of endarterial manœuvres.

In this connection it is interesting to note that Ewing (1950) examined the abdominal aorta and iliac vessels from his second case on the patient's death 12 months later: the terminal aorta and common iliac vessels were much narrowed and blocked by clot, high enough to include the origin of the inferior mesenteric artery. Section of the thrombus suggested that it was "probably over 6 months old."

In spite of the failure to restore the pulses in the present case, the operation cannot be branded as useless or unnecessary. McClure and Harkins (1943) believed the prognosis without operation to be nearly hopeless. Rothstein (1935) found the recovery-rate to be only 4% from conservative measures as against 32% from surgery. Ewing (1950) thinks that even these few successes without surgery are probably cases in which either the diagnosis is doubtful or the clot has broken up and passed distally. In our patient the circulation in the lower limbs is so adequate that the internal iliac arteries may well have remained patent, thus giving a circulation via the gluteal vessels.

The case for removing the axillary embolus rests on less secure grounds. In healthy people the third part of the axillary artery can usually be interrupted without jeopardising the limb. Nevertheless the clot here, as in the aorta, was several centimetres long, and must have covered the mouth of at least one major branch. The brisk retrograde bleeding that followed its removal lent support to the idea that the procedure would materially enhance the safety of the limb by improving the collateral circulation. It is also felt that the main vessel might for a short time maintain the nutrition of the limb while the collateral channels were developing. Had the patient's condition been too precarious to allow axillary embolectomy, however, conservative measures would have had a fair chance of success.

Prognosis and After-treatment

Besides the 27 successful aortic embolectomies reviewed by Taylor (1951) 2 have been reported by Ewing (1950), 1 by Dalgleish and Taylor (1951), and 1 by Shipman and Goodwin (1951). The present case brings the total to 32.

Of the 32 patients at least 13 are known to have died within 3 years of operation, and several others have not been followed up. This major vascular catastrophe occurs almost always in patients with crippling cardiovascular disease, by which the end-result should be measured. Some workers have attacked the problem of recurrent arterial embolism by operations on the left auricular appendage, where the embolising thrombus often forms. The feasibility of amputation of the appendage in dogs was demonstrated by Hellerstein et al. (1948). The operation was performed in man by Madden (1949). Of his 2 patients one survived, but the other after a successful aortic embolectomy, died 9 days after the second operation. Baronofsky and Skinner (1950) simplified the operation by substituting ligation for resection of the appendage, and published 3 cases without fatality. These operations, however, do nothing to improve the basic heart condition. According to Taylor (1951) 78% of the successful aortic embolectomies have been in cases with mitral stenosis or with auricular fibrillation, or with both. On general principles one would expect the more recently developed operation of transatrial mitral valvotomy to have a place in the cases with mitral stenosis. In their report on mitral valvotomy Baker et al. (1952) say:

> "We now regard such a history (of embolism) as one of the indications for valvotomy in the hope that less stasis in the atrium will discourage clotting."

It was on precisely such reasoning that the present case was referred to the cardiac surgical unit. Many more cases and some years' observation will be necessary to determine whether the prevention of recurrent embolism by such means is anything but a pious hope.

SUMMARY

A case is described of simultaneous embolism in the axillary artery and at the aortic bifurcation.

Multiple embolectomy was successful in saving the patient and the affected limbs, and some points in technique are discussed.

Mitral valvotomy was subsequently performed elsewhere, with a view to improving the cardiac prognosis and preventing further embolism.

Our thanks are due to Dr Branford Morgan for referring the case and for help in the postoperative management.

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THE METATARSAL FORMULA IN RELATION TO MARCH FRACTURE

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THE relative protrusion of the first and second metatarsal bones in the normal human foot is a much disputed subject. Morton (1927) is of the opinion that relative "shortening" of the first metatarsal is abnormal and a potent source of foot disorders. A similar view has been advanced by Bruce (1937), who states that in the normal foot the head of the first metatarsal is "on the same transverse plane, or even a little more distal, than that of the second." On the other hand, Wood Jones (1949), in discussing the metatarsal formula, denies that the so-called "short" first metatarsal is in any way abnormal, and maintains that "it is normal in man for

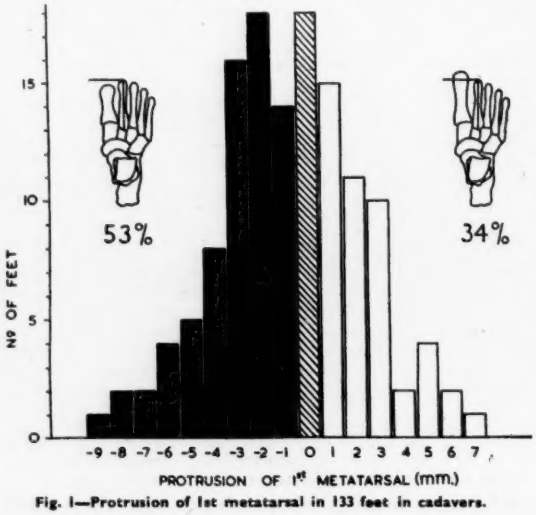

Fig. 1—Protrusion of 1st metatarsal in 133 feet in cadavers.

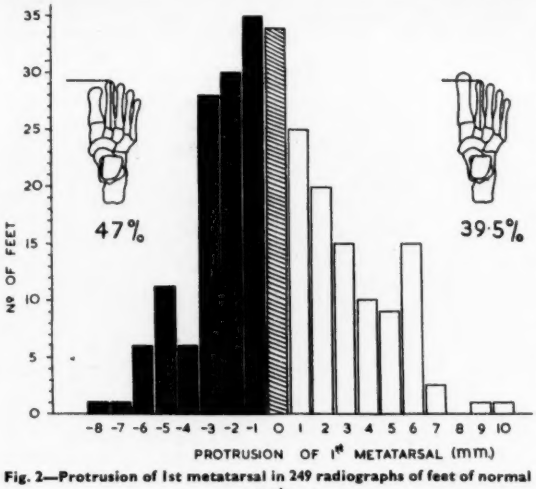

Fig. 2—Protrusion of 1st metatarsal in 249 radiographs of feet of normal people.

the head of the second [metatarsal] to be the most advanced member of the series."

In view of these conflicting statements the following observations, made on cadavers during an investigation of the human ankle-joint, may be of interest, especially as there does not seem to have been any similar statistical inquiry into this subject.

OBSERVATIONS

In the cadaver 133 feet were measured by a standard procedure. The toes were amputated at the metatarso-phalangeal joints, and the perpendicular distance was measured from the head of the first metatarsal to a line drawn through the tip of the second metatarsal at right angles to its long axis. This assessment of the relative prominence of the two bones accords with Morton's method, which, although open to criticism (Harris and Beath 1949, Hardy and Clapham 1951), is the one most widely used and is moreover the method adopted by the protagonists in this controversy.

There were two possible sources of error in the series: (1) the subjects were all elderly, many showing minor foot disorders, and (2) the muscles had been dissected away and consequently a partial collapse of the medial longitudinal arch was sometimes found. To estimate the effect of muscle stripping, 18 feet were radiographed before dissection. The measurements obtained from the radiographs did not differ materially from those made from the specimens after dissection. To assess whether age had any effect, 249 radiographs of normal people, most of whom were between the ages of 16 and 20, were measured by Morton's method. These radiographs were obtained by a standard technique and have been fully analysed by Hardy and Clapham (1951). Their method of recording metatarsal protrusion differed from that adopted in the present investigation, however.

The findings in the two series are illustrated by histograms. The first metatarsal was less prominent than the second in 53% of dissected feet (fig. 1), and in 47% of the radiographic series (fig. 2). Statistical analysis shows no significant difference between the two sets of data. It therefore seems justifiable to combine the two sets of figures and to state that the first metatarsal is less prominent than the second in about half the total of 382 feet.

The relative protrusion of the first 2 metatarsal heads is not only of academic interest, for Morton's views on the mechanics of human gait are based on the supposition that the two bones normally extend to the same transverse line. Before any foot disorder can legitimately be ascribed to "shortness" of the first metatarsal, the normal anatomical variation must be recognised. For example, in the 15 feet showing march fractures recorded by Flavell (1943) the variation in metatarsal protrusion does not differ significantly from that found in the present series of normal feet. In a large series of fractures of the second metatarsal bone analysed by Leveton (1945) this bone protruded beyond the first in 49 out of 87 cases. Leveton tentatively concluded that "if the second metatarsal is longer and protrudes beyond the other segments it is apt to be the site of fracture," but this statement is valid only if there is a higher incidence of protrusion of the second metatarsal in the pathological series than in a normal one. In fact, statistical analysis indicates no significant difference between Leveton's figures and the normal incidence described above. At present there is insufficient evidence to incriminate protrusion of the second metatarsal as the important predisposing factor in the ætiology of march fracture.

SUMMARY

133 dissecting-room feet, and radiographs of 249 normal people, have been measured by Morton's technique. In about half of them the first metatarsal was less prominent than the second. This normal variation should be borne in mind when considering the ætiology of march fracture.

We are indebted to Prof. H. A. Harris, Prof. M. F. Lucas Keene, and Prof. J. Z. Young for allowing us to study material in their departments; to Dr. R. H. Hardy for his generosity in placing his radiographs at our disposal; and to Dr. D. A. Sholl for statistical advice.

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INFLUENZA IN EARLY PREGNANCY

EFFECTS ON THE FŒTUS

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A FAIRLY severe epidemic of influenza (A-prime) in Northern Ireland in December and January, 1950–51, afforded an opportunity to discover whether influenza in the early months of pregnancy produces fœtal abnormalities, in a manner similar to rubella.

A meeting of obstetricians, pædiatricians, and public-health medical officers was held; and, since retrospective inquiry, after delivery, into the illnesses of early pregnancy is liable to yield inaccurate information, this meeting decided that the inquiry should be prospective. A small committee * drew up the following plans:

The survey was to include, as far as possible, all mothers attending the antenatal clinics of the Belfast City Hospital, the Royal Maternity Hospital, Belfast, and the maternity and child-welfare service of Belfast Corporation, the first day of whose last menstrual period was between Sept. 1, 1950, and Jan. 31, 1951.

Each of these mothers would be asked whether she had influenza, defined as "a febrile illness with a sharp onset, characterised by pains in the legs, back, or head, and sufficiently severe to require that the patient went to

* The committee consisted of Prof. A. C. STEVENSON, Dr. H. A. WARNOCK, Mr. W. S. CAMPBELL, F.R.C.S., and Mr. G. B. GIBSON, F.R.C.S.

TABLE I—ANALYSIS OF 989 BIRTHS

Births	Mother's influenza history	Male births			Female births			Total births		
		Pregnancy order			Pregnancy order			Pregnancy order		
		1st	2nd and over	Total	1st	2nd and over	Total	1st	2nd and over	Total
Total	I	56	32	88	35	41	76	91	73	164
	NI	195	255	450	172	203	375	367	458	825
Stillbirths	I	2	..	2	1	1	2	3	1	4
	NI	3	2	5	4	3	7	7	5	12
Stillbirths per 100 total births	I	3·6	..	2·3	2·9	2·4	2·6	3·3	1·4	2·4
	NI	1·5	0·8	1·1	2·3	1·5	1·9	1·9	1·1	1·5
Deformed stillbirths	I	1 (anencephalic)	..	1	..	..	..	1	..	1
*	NI	2 (2 anencephalic)	..	2	1 (spina bifida)	2 (1 anencephalic) (1 I.V.D.)	3	3	2	5
Live births	I	54	32	86	34	40	74	88	72	160
	NI	192	253	445	168	200	368	360	453	813
Deformed live births	I	..	1 (absence of kidney)	1	1 (club-foot)	2 (1 club-foot) (1 spina bifida)	3	1	3	4
	NI	2 (2 hare-lip)	1 (mongol; cardiac defect)	3	4 (2 club-foot) (1 ventral hernia) (1 septal defect)	..	4	6	1	7
Deformed live births per 100 live births	I	..	3·1	1·2	2·9	5·0	4·1	1·1	4·2	2·5
	NI	1·0	0·4	0·7	2·4	..	1·1	1·7	0·2	0·9

I = mother had, and NI = mother did not have, influenza during first four months of pregnancy.

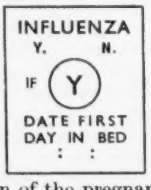
TABLE II—MOTHERS WHO HAD INFLUENZA: ALL PREGNANCY ORDERS

—	1st month			2nd month			3rd month			4th month			Total		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Normal live births	19	16	35	19	18	37	23	21	44	24	16	40	85	71	156
Deformed live births	..	..	..	..	2 (1 club-foot) (1 hydrocephalic)	2	1 (absence of kidney)	..	1	..	1 (club-foot)	1	1	3	4
Total live births	19	16	35	19	20	39	24	21	45	24	17	41	86	74	160
Normal stillbirths	1	1	2	..	..	..	..	1	1	..	..	..	1	2	3
Deformed stillbirths	..	..	..	..	..	..	..	..	..	..	..	..	1* (anencephalic)	..	1*
Total stillbirths	1	1	2	..	..	..	..	1	1	..	..	..	2	2	4

* Date of last menstrual period unknown.

bed, the first day of the illness falling between Dec. 15 and Jan. 31 inclusive."

The antenatal record of the mother would be stamped with a special stamp, which would be marked by the obstetrician concerned.



On the completion of the pregnancy, the result would be classified by the pædiatric staff of the hospitals, or by the medical officers of the maternity and child-welfare service, as "normal stillbirth," "deformed stillbirth," "normal live birth," or "deformed live birth."

A total of 989 births were recorded in this way (table I).

Table II sets out in slightly more detail the 164 births to mothers who had influenza: it shows the month of pregnancy in which the infection occurred.

Although the incidence both of stillbirth and of deformed live birth is rather higher in the "influenza" group than in the control group the difference is in each case slight and cannot be regarded as significant.

CONCLUSION

A group of mothers who had influenza (A-prime type) in the early months of pregnancy, and a similar group who did not have influenza, were observed during their pregnancies.

The findings do not suggest that influenza in the early months of pregnancy adds appreciably to the risk of stillbirth or fœtal abnormality.

This report could not have been made without the willing coöperation of the staffs of the hospitals concerned and of the maternity and child-welfare service of Belfast Corporation, who compiled the bulk of the records. The investigation was made under the general direction of Prof. F. M. B. Allen, Prof. C. H. G. Macafee, and Prof. A. C. Stevenson. Tables I and II were prepared in the Department of Social and Preventive Medicine, Queen's University, Belfast.

"... informed opinion is moving away from the use of death rates or even of sickness rates as a measure of 'health' in the highest sense of that word. It may be asked how many of the citizens of Cardiff are enjoying that state of sparkling or 'positive' health that it is a joy merely to be alive, a continuing joy not dependent on momentary external stimuli. ... Some of us have known that 'joy-to-be-alive' feeling as we came out of the sea on our summer holidays, but how much of it have we retained since we returned to everyday life? Unfortunately the nation has become so obsessed with the idea that to *cure* all is the end all and the be all of existence that the higher ideal of 'positive' health becomes an ever receding goal. The idea seems to be that if you only cure enough people of illness there will be no illness left and therefore only health will remain."—Dr. J. GREENWOOD WILSON, medical officer of health for Cardiff, in his report for 1951.

Medical Societies

MANCHESTER MEDICAL SOCIETY

Cerebral Abscess

AT a meeting of the pathology section of Manchester Medical Society on Nov. 12, Dr. G. K. TUTTON said that the improvement in the results of surgical treatment of intracerebral abscesses was due to the control of bacterial infection by antibiotics and the avoidance of open traumatising drainage procedures. A 20-year review of the cases seen in the Manchester University neurosurgical unit showed an increasing number of cases and a diminished death-rate since the use of penicillin in 1945. The mortality for treated cases of all types up to 4 years ago was 60% ; for 68 cases since then it had fallen to 29%, or 13% (in 54 cases) excluding 14 untreated patients in whom the condition was undiagnosed during life.

Bacteriological examination was of paramount importance, since this indicated the correct choice of antibiotic. For diagnosis and localisation great use had been made of electro-encephalography, which showed a characteristic slow delta activity with a delta focus very close to all underlying supratentorial abscesses. Air ventriculography was rarely used, but occasionally carotid arteriography was of value.

By these means abscesses could be so precisely localised that aspiration was feasible. Excision, either early or late, was practised only in certain cases where aspiration had failed.

Abscesses were due either to direct or to vascular spread, either from extrathoracic sources or from suppurative chest lesions. Of 8 patients with cerebral abscesses from extrathoracic sources none had died ; but of 10 patients with abscesses from thoracic lesions 3 had died. In the latter group the diagnosis was reached less quickly, and here antibiotics were the most important therapeutic factor. 3 patients with multiple cerebral abscesses had had successful pulmonary resections. Of 23 patients with frontal or occipital lobe abscesses, mostly from direct spread of infection, none had died. Of 12 patients with temporal otogenic abscesses 1 had died ; and of 7 with cerebellar otogenic abscesses 3 had died. Qf 12 patients with abscesses, vascular in origin, in the parietal lobe 3 had died.

Of the last 37 cases of cerebral abscess, 21 had penicillin-sensitive organisms and were sterile after two aspirations and instillation of penicillin ; 2 needed more than three aspirations, and 2 never became sterile so that excision was necessary. The remaining 16 cases, which had penicillin-resistant organisms, were otogenic. In penicillin-resistant cases there was no really suitable antibiotic for local instillation ; for streptomycin has a limited action, and chloramphenicol and aureomycin were relatively insoluble. Polymyxin has been tried in 1 case only. In 6 cases due to resistant organisms local application of a 1 : 1000 solution of hydrarg. perchlor. had proved useful.

Dr. LEWIS PARKER referred to 68 cases of brain abscess, 60 of which had been examined bacteriologically. From the initial specimens of pus 61 strains, from 10 species or groups of associated species, of bacteria were isolated. The commonest organisms were *Staphylococcus pyogenes* (15), *Proteus vulgaris* (11), and non-hæmolytic streptococci (9). This wide range of bacteria underlined the need for careful bacteriological examination.

Dr. Parker outlined a comprehensive technique of examination, including stained film of the pus ; blood-agar plate culture incubated under aerobic, micro-aerophilic, and anaerobic conditions ; and broth culture in Brewer's thioglycollate medium, glucose broth, and Hartley's broth.

The bacteria found in an abscess were related to the bacterial flora at the primary source of infection. Thus abscesses in the temporal lobes or cerebellum, due to direct spread from the ear and associated structures, were mainly due to gram-negative bacilli, *Proteus vulgaris* being the commonest ; anaerobic organisms had been found on several occasions. Abscesses in the frontal lobe following direct spread from the frontal sinuses were due to normal inhabitants of the upper respiratory tract, mainly gram-positive cocci.

Abscesses arising through direct-spread from osteomyelitis of the skull or through fracture of the skull were usually due to *Staph. pyogenes*. Hæmatogenous spread from the chest was due mainly to non-hæmolytic streptococci and the bacteroides group of organisms ; in 5 of these 12 cases no organisms had been isolated from the pus. Other workers had also experienced this high proportion of negative findings.

The sensitivity of the organisms to antibiotics was determined by the dried-disc and by the serial-dilution techniques. Local administration of the appropriate antibiotic was necessary when the abscess was encapsulated. Penicillin and streptomycin were given most commonly. In many cases the abscess was rapidly sterilised, but in some the organism proved resistant to these antibiotics, and in 4 of such cases chloramphenicol or aureomycin had been used locally with good results. The combined administration of two or more antibiotics had been considered in recent cases, but this had not been found necessary in any of the cases investigated.

Reviews of Books

The Science and Art of Joint Manipulation

Vol. 2. *The Spinal Column*. JAMES MENNELL, M.A., M.D. Camb., consulting physician in physical medicine, St. Thomas's Hospital. London : J. & A. Churchill. 1952. Pp. 264., 42*s*.

PERHAPS science and art should be transposed in the title of this book, which complements Dr. Mennell's earlier volume on the extremities. On such topics as the "binding" of joints and sacro-iliac strain he sets out at length individual views which may not be universally accepted. And yet, as in other fields, such is the importance of close attention to the patient, in sum and parts, that the application of a particular skill may yield empirically the most satisfactory results. Of the practical value of Dr. Mennell's methods there can be no shadow of doubt, even if some of his therapeutic arrows succeed by reaching quite other than their ostensible targets. And who will not applaud the comment that "It is not a great thing to ask that, when symptoms do not conform to routine diagnosis or do not respond to treatment, the joints corresponding to the region of the symptoms should be examined"? Errors in diagnosis will persist until the technique of joint examination takes its proper place in medical and orthopædic training. Meanwhile, we can refer to Mennell.

Biochemistry and Human Metabolism

B. S. WALKER, M.D., PH.D., professor of biochemistry, Boston University School of Medicine ; W. C. BOYD, PH.D., professor of immunochemistry, Boston University School of Medicine ; I. ASIMOV, PH.D., assistant professor of biochemistry, Boston University School of Medicine. Baltimore : Williams & Wilkins. London : Baillière, Tindall, & Cox. 1952. Pp. 784. 68*s*. 6*d*.

THIS outstanding book contrives to present modern biochemistry, without undue simplification, in the main fields which touch on clinical medicine, and it also tells the biochemist about the medical significance of his subject. These things it does in a style so free that it is a pleasure to read. The organisation of the contents is unusual for a textbook of biochemistry : it deals first with structure, pride of place being rightly given to proteins, and then with control by enzymes and hormones, with growth (with consideration of nucleoproteins, cancer, and heredity), with metabolism, including nutrition, digestion, respiration, excretion, and electrolytes, and finally with the pathology of vitamin

deficiencies and infections. There are useful appendices on colloid chemistry, isotopes, thermodynamics, and acids and bases. One of the most valuable and novel chapters is that on genetics, the biochemical implications of which are fast expanding, and the authors are not afraid to speculate on the relation of protein structure to the mechanism of memory and imagination, or to discuss smell and taste in terms of enzyme inhibitors. The basal metabolic rate in cases of Simmonds's disease is erroneously given as "minus 50 or less," and leukæmia is omitted from the list of conditions with a raised blood uric acid; but there is little else to criticise and much for the clinician to respect and value in this book.

Gynäkologische Strahlentherapie

Indikationsstellung, Methodik und Ärztliche Betreuung. Dr. Med. RICHARD KURT KEPP, professor of obstetrics and gynæcology, University of Göttingen. Stuttgart: Georg Thieme. 1952. Pp. 232. DM. 26.

THIS book from the gynæcological department of Göttingen University gives a long and detailed account of the radiotherapeutic methods used in many benign and malignant conditions.

The first section deals with menopausal and premenopausal hæmorrhage and lays emphasis on two different effects—one obtained locally by the irradiation of the endometrium, the other produced by the radiation received by the ovary—and gives techniques designed to obtain one or the other effect. Several techniques not in ordinary use in this country are described, such as irradiation of the hypophysis for menopausal symptoms attributed to hormonal disorder, using two fields 6×8 or 8×10 cm., and giving doses of 150–200r on two or three occasions with a further course after 3–6 months. Other endocrine glands are also irradiated to alter their activity, and excessive bleeding in young girls is treated by irradiation of the spleen.

With malignant disease of the uterus, operation is usually chosen for patients whose tumour is in a favourable position. When radiotherapy is preferred much reliance is placed on intracavitary treatment with X rays generated at 60 or 100 kilo-volts. The method is ingenious, and if the vagina is roomy and not severely distorted by tumour a good distribution of the radiation can be obtained. For the treatment of cancer of the uterine body the uterus is packed with radium tubes. Carcinoma of the vulva treated by radiation receives fractionated superficial X radiation, and fast electrons generated at 4 MeV are beginning to be used as an alternative. Cancer of the breast is included because it is regarded, in Germany, as coming within the province of the gynæcological department. Both preoperative and postoperative radiation is used, mainly with two tangential fields to the breast area and with single fields to axilla and supraclavicular fossa; and palliative techniques are used for inoperable cases. There is a useful chapter on the treatment of post-radiation complications, but there are no statistics giving the results obtained by the use of the methods described. There is a long bibliography.

Psychosurgical Problems

Editor: FRED A. METTLER, M.D., professor of anatomy, College of Physicians and Surgeons, Columbia University. London: Routledge & Kegan Paul. 1952. Pp. 357. 42*s*.

THIS is a companion volume to the Columbia Greystones Associates' earlier report on selective partial ablation of the frontal cortex. Here the results of cortical venous ligation, thermocoagulation of the cortex, surgical thalamotomy, and transorbital lobotomy are considered. Besides reviewing the over-all psychiatric results, attempts were made to study changes in general medical condition, including autonomic functions, the neurological state, detailed psychometric tests, and psychological functions such as memory, learning, "attitude," and certain perceptual and motor abilities. Apart from the clinical psychiatric sphere, few changes were observed—except for transient neurological disorders, following venous ligation. The fact that this evidence was negative implies no criticism of the work, because assessment of this kind of therapy must, of course, call for much negative finding. The length and method of recording it, however, seem pretentious and out of proportion to the results. It is on the whole a more disappointing volume than the preceding one, though it contains a few useful facts for those who are prepared to traverse wakefully its wastes of turgid prose.

Abraham Trembley of Geneva

Scientist and Philosopher, 1710–1784. JOHN R. BAKER, M.A., D.PHIL., D.SC. Oxfd, lecturer in zoology, University of Oxford. London: Edward Arnold. 1952. Pp. 259. 35*s*.

TODAY, when grafting is a normal part of medical practice and a very great deal is known about the regeneration of damaged tissues, it is interesting to look back a couple of centuries to the time when the scientific study of these subjects was just beginning. In those days many biologists were engaged in static observations. The dynamic Trembley was another kind of person: he was, above all, a student of processes, especially those of growth and reproduction.

Trembley was the first person to show that certain animals can be artificially multiplied by division, the first to make permanent grafts of animal tissues, the first to prove by rigorous experiment that asexual reproduction by budding occurs in animals, and the first to witness cell-division. This fascinating book is Trembley's first full-scale biography. The reader shares the excitement of the experimenter when he first cut a hydra in two in order to determine whether it was a plant or an animal. To his amazement each grew into a normal specimen, indistinguishable from the other. He then cut up his hydras in a variety of ways, but perfect regeneration always took place. Having made the remarkable discovery—that an animal could be multiplied by division—the patient and observant Trembley set himself to solve the inverse question: could two polyps be transformed into one? He made the first successful graft in 1742. He said he owed his discovery to a happy chance, but others think that such chances only occur to those worthy of them.

British Encyclopædia of Medical Practice (2nd ed. London: Butterworth Medical Publications. 1952. Vol. 11. Pp. 718. Vol. 12. Pp. 738. 65*s*. each).—The last two volumes of their task completed in good time for a Christmas breather, the general editor, Lord Horder, and his 12 consultant and associate editors will have had a little time in which to stand back and look at twelve sparkling gold and red volumes on the shelf, and to receive the congratulations they and their contributors have earned so well. The final pair round off the dozen and the alphabet by going from rheumatic infection (an article by Dr. Douglas Hubble) to yellow fever (by Sir Philip Manson-Bahr), the editors having extracted all Z's secrets under earlier letters. A complete analytical index is to follow (each volume already has its own individual index), and this will put the finishing touch to a work of high merit.

The Autonomic Nervous System (3rd ed. London: Henry Kimpton. 1952. Pp. 569. 90*s*.).—It is eleven years since the last edition of this standard work on the autonomic nervous system, by Dr. James C. White and Prof. Reginald H. Smithwick, was published. In this period early enthusiastic hopes about the value of extensive sympathectomies in the treatment of hypertension have been modified, and war experience has clarified the position of sympathectomy in causalgia. In this third edition, the two original authors have been joined by Dr. Fiorindo A. Simeone. The observations of the intervening years are fully considered, and the authors, besides dealing with the disorders in which operation on the autonomic nervous system may be of value, and with the technical details of operation, fully discuss anatomical and physiological factors, and assess the value of drug treatment in modifying autonomic activity

German-English Medical Dictionary (New York and London: McGraw-Hill. 1952. Pp. 586. 102*s*.).—Prof. Louis De Vries, who holds the chair of modern languages at Iowa State College, is an old hand at compiling German-English dictionaries. Ably supported by medical experts, he has set about this latest work with a zest. Some people, we are told, get by well enough with altogether 400 words, but in this technical dictionary *Aal* is separated from *Zytoplasma* by 40,000; and even this, Professor De Vries hints in a preface, may not be enough. Unhappily the price of the book will be more than enough for most would-be translators.

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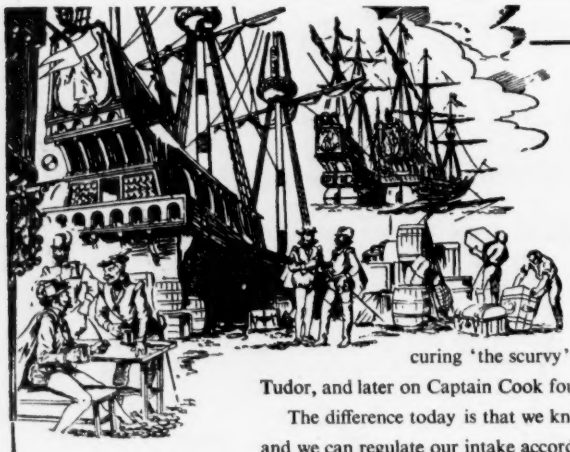

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THE LANCET

LONDON: SATURDAY, JAN. 24, 1953

Experimental Teratogenesis

OUR attitude towards congenital malformations and fœtal death is now changing greatly. There was a time when tragedies of this kind were regarded as a retribution for some maternal sin of omission or commission. MENDEL'S work, however, and the birth of the science of genetics, made it possible to regard monsters as a matter which was finally decided at the moment when conception took place. From this state of mental resignation we were aroused in 1941, when the clinical work of GREGG [1] on the association of maternal rubella with fœtal cataract suggested that even brief interference with the environment of the fœtus during its development sometimes produces congenital abnormalities. Since then other clinical evidence has accumulated.

For the last fifty years the experimental embryologists, led by SPEMANN, have been producing monsters in aquatic creatures by interfering with the embryo. The number of agents used successfully for this purpose is very large, and it appears that the precise nature of the agent may be less important than the timing and the magnitude of the interference. For obvious reasons such methods could not all be applied to the relatively inaccessible mammalian embryo; and a new technique had to be adopted by which the maternal-fœtal system as a whole was exposed to the agent under investigation, the mother conveying this agent indirectly to the developing tissues. Thus HALE [2] was led to suggest that lack of vitamin A in the maternal diet could cause anophthalmos in pigs and since then other workers have investigated in rodents the teratogenic effects of other vitamin deficiencies and of many physical and chemical agents. Among these agents was anoxia, which is easily standardised and readily applied; and we owe to INGALLS and his co-workers at Harvard [3] the idea of using the mouse for a systematic study of the results of maternal anoxia at different stages of pregnancy.

Mice at a known stage of pregnancy were exposed to a low atmospheric pressure for a single period of five hours; and the litter was subsequently delivered by laparotomy on the nineteenth day of pregnancy. Control pregnant mice maintained at normal atmospheric pressure were treated in the same way. The fœtal death-rate was significantly greater in the experimental group than in the controls; and among the living embryos in the test series there occurred gross malformations, such as septal cardiac defects, irregularities and fusions of ribs and vertebræ, cleft-palate, and anencephaly. In the controls some of these defects were not observed at all, and the incidence of others was negligible. INGALLS and his colleagues believe that the genetic strain of the mice used may partly determine the site and incidence of the defects; but the degree and timing of the anoxia are also important. Mice exposed to a pressure equivalent to a height of 27,000 feet produced more deformed fœtuses than those exposed to a "height" of 25,000 feet, and the deformities were more severe. Again, exposure during the ninth or tenth days of gestation caused malformations of the ribs and vertebral column; but the same exposure at other times produced quite different forms of damage. They suggest that anoxia affects the tissues which at the time of exposure are rapidly differentiating and therefore have a high oxygen demand.

This study is undoubtedly of clinical interest. Brief acute anoxia can produce fœtal deformities in mice. What, then, of anoxia in man? There is some fragmentary evidence, summarised by INGALLS and his associates, that among peoples living at high altitudes the incidence of congenital deformities and the fœtal death-rate may be higher than at sea-level. It might also prove valuable to pursue the possibility (already raised by a case-report by OLIM and TURNER [4]) of an association between congenital defects and maternal anoxia from cardiac conditions or acute anæmia. Much more important, however, is the broad concept that lies behind this work. Anoxia is merely a convenient example of what is fashionably called a "stressing agent"; and if, as seems possible, congenital defects can be produced, even though perhaps only in susceptible people, by non-specific maternal stress, a whole new field will at once be opened up for quantitative as well as qualitative study. The problem is a long-term one, especially since experimental results must be correlated with parallel clinical research; but in the end it may be, as INGALLS and his colleagues suggest, "that intelligently conceived measures to protect the fragile embryo or the vulnerable fœtus will ultimately be devised." It is a sound objective.

1. Gregg, N. McA. *Trans. ophth. Soc. Austr.* 1941, **3**, 35.
2. Hale, F. *Amer. J. Ophth.* 1935, **18**, 1087.
3. Ingalls, T. H., Curley, F. J., Prindle, R. A. *Amer. J. Dis. Child.* 1950, **80**, 34; *New Engl. J. Med.* 1952, **247**, 758.

The Postoperative Chest

POSTOPERATIVE chest troubles are still common enough to disturb the abdominal surgeon. It is true that many of the incidents are trivial and appear as a mere exacerbation of pre-existing bronchitis; but at the best they add to the patients' discomforts, and even minor episodes may carry a risk of bronchiectasis or other permanent damage.[5] The usual lesion is an infected area of collapse—commonly of a patchy lobular, or segmental, distribution, but sometimes involving a lobe or a whole lung. Prophylactic breathing exercises and penicillin are still widely used, though PALMER and SELLICK [6] could find nothing to recommend them. However, in an article in this issue they describe very different experiences with inhalations of a bronchodilator, used in combination

4. Olim, C. B., Turner, H. B. *J. Amer. med. Ass.* 1952. **149**, 932.
5. Morle, K. D. F., Robertson, P. W. *Brit. med. J.* Jan. 17, 1953, p. 130.
6. Palmer, K. N. V., Sellick, B. A. *Lancet*, 1952, i, 345.

with assisted postural drainage. Their well-designed trial leaves no doubt that these measures largely prevented postoperative radiological change and productive cough. They were applied before operation until no more sputum could be produced; thus no patient was operated on until any bronchitis present had subsided. Since postoperative chest complications are uncommon in patients who are completely free from cough before the operation, one wonders how far the success of these measures is due to their preoperative use and how far they affect the established condition when applied later. But PALMER and SELLICK did not set out to answer these questions, which have theoretical as well as practical implications.

While nearly everyone agrees that a combination of viscid sputum and reduction of respiratory effort and cough by pain or opiates is the cause of the bronchial obstruction, the precise timing and course of events is still uncertain. The term "atelectasis" is used rather vaguely by many radiologists. Certainly many shadows so reported are due to pneumonia in a moderately shrunken area of lung, rather than to absorption of air alone; and one may sometimes see typical "jib" shadows clear without re-expansion, as shown by the position of the fissures and other landmarks, leaving the area of uncomplicated collapse quite inconspicuous. Indeed it seems likely that the uninfected stage of lobular or segmental collapse can be radiologically invisible. Moreover, it is very unlikely that such lesions cause pyrexia or constitutional upset until infection supervenes. The point of these considerations is that it is difficult to demonstrate the earliest stages of the lesions or to define the onset of the process. There is some evidence that it starts earlier than is often supposed. STRINGER [7] found that of 13 patients who developed radiological opacities, 5 had abnormal films as early as four hours after operation. CASSELS and RAPOPORT [8] described pulmonary collapse occurring during operation; but these were instances of massive collapse producing immediate signs, and it is probable that the segment or the lobule can collapse without being noticed. If in fact the blockage of the bronchus and the absorption of air commonly begin during the operation, the preoperative state and the anæsthetic technique may well be more important than the postoperative treatment. A factor worth attention is the effect of anæsthetic mixtures on the rate of air absorption. DALE and RAHN [9] have shown that collapse following bronchial occlusion is accelerated sixtyfold when pure oxygen is breathed in place of air. The oxygen content of an anæsthetic mixture might thus determine whether a region of lung distal to a bronchial obstruction was or was not airless when the patient recovered consciousness and started to cough; and complete airlessness must greatly decrease the chance of early dislodgement of the obstruction. PALMER and SELLICK's results suggest a substantial prophylactic advance, and we hope that their valuable analysis will be continued to explore further the corollaries to their encouraging news.

7. Stringer, P. *Ibid*, 1947, i, 289.
8. Cassels, W. H., Rapoport, A. E. *Anesthesiology*, 1944, **5**, 174.
9. Dale, W. A., Rahn, H. *Amer. J. Physiol.* 1952, **170**, 606.

Tuberculosis Mortality

SINCE 1850 the Registrar-General has published year by year the mortality-rate from tuberculosis for each sex by age-groups. Those figures reveal a striking fall in the mortality in all age-groups; and most people agree that this must have been due to improved environmental conditions. Apart from this general fall the most interesting feature is the change in the age-distribution; and there is now a very distinct difference between the sexes: for females the death-rate is greatest in early adult life, whereas for males it is greatest at about the end of working life.

FROST,[1] who has since been followed by others, suggested that this late peak in males could be better understood if it was studied in relation to the even higher rates experienced by the same group of men when young adults; an entirely new picture emerged when the rates were studied for "cohorts" instead of calendar years or decennia. This view was re-stated by SPRINGETT,[2] who showed that, if it were accepted that the mortality curve for females followed a more acutely peaked pattern, the postponement of the age of maximum mortality of males, and not of females, could be explained mathematically. While largely accepting this reasoning, MCDONALD [3] has suggested that the late peak of mortality in men is associated with environmental conditions at work. He bases this view on differences between various occupational, social-class, and geographical groups in England and Wales in the present century; but he does not discuss the possible influences of "migration," not only geographically but also from one occupation to another and from one social class to another. Possibly, as MCDONALD concludes, environment at work is partly responsible for the present high mortality in older men; but the fact that single women engaged in employment have the same pattern of mortality as married women (though with a rather higher death-rate among the employed) does not suggest that this influence can be very strong. Furthermore, a century ago, when men worked under far worse conditions and their wives were for the most part at home, the greatest mortality for each sex was in young adult life.

RUSSELL [4] has approached these mortality-rates in a rather different way. He points out that the grouped data used by previous workers, based on 10-year age-groups and decennia, are not an exact guide to the tuberculosis mortality of cohorts. He has accordingly estimated the general and the tuberculosis mortality of twenty-four cohorts of females born in 3-year periods from 1851–53 to 1920–22. His results confirm the great fall in tuberculosis mortality and the general constancy of the pattern of mortality in cohorts, except when disturbed by such gross influences as the first world war and the influenza epidemic of 1918–19. He confirms also the fact, first recorded by PICKEN,[5] that by the cohort method of analysis, as well as by the conventional calendar-year method, the age of maximum mortality for women is passing to younger age-groups. RUSSELL states that previous investigations based on the cohort method of study have emphasised the dependence of pulmonary

1. Frost, W. H. *Amer. J. Hyg.* 1939, **30**, 91.
2. Springett, V. H. *J. Hyg., Camb.* 1950, **48**, 361.
3. McDonald, J. C. *Brit. J. soc. Med.* 1952, **6**, 259.
4. Russell, W. T. *Med. Offr*, 1952, **88**, 269.
5. Picken R. M. F. *Publ. Hlth*, 1940, **53**, 145.

tuberculosis mortality in adult life on that experienced by the same group in *childhood*. This is not entirely correct: the most distinct relation shown by previous workers is between the tuberculosis mortality of young adult life (15–24 years) and that of later age-groups; in fact the childhood, and especially the under-5-year, rates do not fit at all well with the cohort pattern. RUSSELL has calculated the correlations between four variables: childhood environment, childhood tuberculosis infection, adult environment, and adult tuberculosis mortality. The correlations between these variables would be of great importance if the indices taken as representing them were fully acceptable. RUSSELL, however, measures adult environment by the adult mortality from all causes other than tuberculosis. KERMACK et al.[6] have shown that mortality from all causes tends to be determined by the childhood experience of the cohort. Hence the high degree of correlation shown by RUSSELL between pulmonary tuberculosis mortality and general mortality in the same 5-year age-group cannot be ascribed solely to the dependence of tuberculosis mortality on contemporary environmental conditions. RUSSELL confirms HILL'S [7] earlier finding that there is no statistical evidence from the national figures that the decreasing tuberculosis mortality under 15 years of age is associated with any rise in tuberculosis mortality in older age-groups.

Both RUSSELL and MCDONALD doubt whether the behaviour of tuberculosis mortality in later life can be fitted completely into the cohort pattern; and it is obvious that the mortality of females accords with this pattern less closely than does that of males. The strongest evidence of the importance of contemporary environment is the response of tuberculosis mortality of all age-groups to gross influences, such as war. Let us hope that the considerable falls in mortality since the introduction of chemotherapy will distort the cohort pattern in the opposite direction.

6. Kermack, W. O., McKendrick, A. G., McKinlay, P. L. *Lancet*, 1934, i, 698.

7. Hill, A. B. *J.R. statist. Soc.* 1936, 99, 247.

Annotations

REMOTE CONTROL OF EPIDEMICS

THE epidemiologist is very like the detective both in his way of reasoning and in his working methods. Like the detective, too, he may be either the armchair type or the man who runs about looking for clues. Usually he manages to find the cause of his disease close to the site of the crime, but two interesting reports suggest that some diseases may operate from a distance.

The first is Murray Valley encephalitis, a disease which broke out in Northern Victoria and New South Wales early in 1951.[1] Workers in Melbourne isolated the causative virus [2] and showed by serological tests that a large number of healthy people, horses, dogs, and wild birds must have been subclinically infected.[3] At the same time workers in South Australia [4] isolated from a fatal case near Adelaide a virus which was identical with the Melbourne virus and closely related to the virus of Japanese B encephalitis. Now, Miles and Howes [5] report the results of further investigations into the epidemiology of this strange disease. Sera taken from aborigines in the Northern Territory in the absence of a recent epidemic showed as high a prevalence as sera from the Murray Valley; and this suggested that the disease might be endemic in Northern Australia. Presumably the infection is, like Japanese B encephalitis, primarily one of wild birds, and infection of man is an unfortunate accident. Murray Valley encephalitis is clinically and pathologically indistinguishable from the mysterious Australian "X" disease, of which three epidemics have been reported. Miles and Howes suggest that Australian "X" disease is in fact an endemic infection of birds in the Northern Territory and Queensland which periodically spills over into Central and Southern Australia to produce epidemics in man. In Western Australia, and presumably also in Northern Australia, the breeding of birds does not depend so much on the time of year as on rainfall. Accordingly, meteorological data from the Northern Territory and Queensland for the past forty years were examined, and a most impressive correlation was found between years of high spring rainfall and epidemics of Australian "X" disease or Murray Valley encephalitis. In seasons with exceptionally early rains birds breed early, and young birds move to the south at a time when mosquitoes and locally bred birds are numerous. As a result, epizootics start in the newly infected area and cases appear in the neighbouring human population. If this reasoning is correct—and it seems reasonable—further outbreaks of Australian "X" disease can be expected when the rainfall in remote Northern Australia is high in the spring. It may be well, however, to remember C. H. Andrewes's comment that epidemiologists have their greatest successes in spotting cycles of past epidemics, and that they are often less successful in prediction.

The second disease that may operate from a distance is poliomyelitis. This infection is commonly supposed to spread by direct contact via infected pharyngeal secretions, although the demonstration by Kling et al.[6] that the virus can be recovered from sewage raised the possibility of fæcal transmission. Fæcal transmission may prove commoner than many people think if epidemiologists are as vigilant as Huss et al.[7] These workers investigated an outbreak of poliomyelitis in Malmö in 1949. They noticed that the incidence of cases was much higher in Malmö than in other Swedish cities, and that the first ten cases occurred at about the same time in people who had had no contact with one another. The possibility of a common source of infection was investigated; and, surprisingly, samples of drinking-water were found to be contaminated with fæcal bacteria. The complex water-supply of Malmö was explored and the infection traced to an uncovered reservoir. A 15-litre sample of this water was concentrated, treated with ether to remove bacteria, and inoculated into monkeys; these animals developed paralysis and histological evidence of poliomyelitis. Virus was found in a second sample of water taken four months later—a result that is in keeping with the known stability of poliomyelitis virus. But how did the virus get into the reservoir? Contamination from sewage pipes was excluded; but the reservoir is close to the sea, into which sewage is discharged, and wild duck and gulls, which had been seen on the reservoir, may have passively carried sewage from the sea. Huss and his co-workers hope that in further experiments they will add the final links to this chain of evidence.

To those who like epidemiological stories there will be the same fascination in these investigations as in a detective story. But perhaps it is best not to confess to too much amazement lest the epidemiologist should retort: "Elementary, my dear Watson."

1. See *Lancet*, 1952, i, 501.
2. French, E. L. *Med. J. Aust.* 1952, i, 100.
3. Anderson, S. G., Donnelley, M., Stevenson, W. J., Caldwell, N. J., Eagle, M. *Ibid*, p. 110.
4. Miles, J. A. R., Fowler, M. C., Howes, D. W. *Ibid*, 1951, i, 799.
5. Miles, J. A. R., Howes, D. W. *Ibid*, Jan. 3, 1953, p. 7

6. Kling, C., Wernstedt, W., Peterrson, A. *Z. ImmunForsch.* 1912, 12, 316.
7. Huss, R., Kling, C., Norlin, G. *Ann. Inst. Pasteur*, 1952, 83, 755.

THE PAINFUL SHOULDER

SHOULDER pain can be a baffling diagnostic problem, as Furlong [1] has lately reminded us. The pain may not arise in the shoulder at all: it may originate in a neighbouring structure; or it may be referred from a more distant region, such as the neck or thorax. True shoulder pain is felt immediately distal to the acromion process; and it often radiates diffusely down the lateral aspect of the upper arm, usually to about the junction of its middle and lower thirds; it seldom extends below the elbow. It is almost invariably associated with physical signs in the shoulder, such as local tenderness, swelling, or increase of warmth, impairment of mobility in one or more directions, exacerbation of pain on movement, or crepitation. Pain of somewhat similar distribution may be caused by lesions involving the brachial plexus or its roots, such as prolapsed cervical disc, osteophytic outgrowths in cervical osteo-arthritis, and tumours in the spine, neck, or thoracic inlet. But pain from these causes often radiates throughout the length of the limb to the forearm and hand; it may be associated with neurological signs; and the shoulder itself shows no abnormality. It is worth remembering, also, that pain in the shoulder may be a prominent feature of diaphragmatic irritation (for example, from an inflamed gall-bladder) and of angina pectoris. Nelson [2] has lately given an admirable account of the differential diagnosis of shoulder pain.

Once it is established beyond reasonable doubt that the pain arises in the shoulder-joint, the next step is to consider each of the possible causes. Apart from recent injuries, the number of recognised affections of the shoulder is fairly small, and their differentiation is usually not difficult. Like other joints, the shoulder is subject to the common forms of inflammatory arthritis (acute suppurative, rheumatoid, tuberculous). Unlike other large joints it is only rarely affected by osteo-arthritis (presumably because it is seldom subjected to thrust-stresses). On the other hand it is commonly the site of affections that have no true counterparts in other joints. The chief of these are the supraspinatus, or painful-arc, syndrome, rupture of the musculo-tendinous cuff (often termed, less accurately, the "rotator" cuff), and "frozen" shoulder.

The *supraspinatus syndrome* is common, clinically distinctive, and satisfactorily explained by the structural relationships in the upper part of the shoulder. During the mid-phase of shoulder abduction the non-articular part of the upper end of the humerus passes close beneath the coraco-acromial arch; the clearance just suffices to accommodate the structures that lie between them—the supraspinatus and adjacent tendons blending with the capsule, and the flimsy walls of the subacromial bursa. Consequently if any tissue in this area is swollen and tender it will be nipped between humerus and coraco-acromial arch during the critical mid-phase of abduction, thereby causing the painful arc of movement characterising this syndrome. Five distinct lesions may be primarily responsible: minor rupture of supraspinatus tendon fibres, supraspinatus tendonitis (a localised degenerative lesion), calcified deposit in the supraspinatus tendon, subacromial bursitis, and a minimally displaced avulsion fracture of the greater tuberosity.

Rupture of the musculo-tendinous cuff raises problems of applied anatomy, of diagnosis, and of treatment. The classical picture of a major tear of the supraspinatus and adjacent tendons is well known: there is inability to abduct the arm through the early part of its range, though if the limb is abducted passively the position can often be sustained against gravity without assistance. But theoretically the deltoid muscle should be sufficiently powerful to abduct the arm against gravity without the aid of the supraspinatus, and it is not understood fully why it usually cannot do so. The most likely explanation is that the supraspinatus normally keeps the articular surface of the humeral head closely applied to the glenoid fossa, thereby ensuring a stable fulcrum of movement. Without supraspinatus action the humeral head tends to be pulled upwards away from the glenoid fossa by the deltoid, and the stability of the normal fulcrum is lost. Early diagnosis of major tears of the cuff is difficult because certain other painful lesions of the shoulder can cause temporarily a similar loss of abduction, through reflex inhibition. Yet prompt diagnosis is important because operative repair is easier and more likely to be effective in the early stages. Ellis [3] has recently called attention to two aids to diagnosis—the procaine-injection test and contrast arthrography. By injection of procaine into the area of tenderness pain is temporarily abolished: if the patient is thereby enabled to abduct the arm actively against gravity a major tear is unlikely. Arthrography will demonstrate a communication between the shoulder-joint and the subacromial bursa: if a communication is present the tendinous cuff must be torn. These tests can be of real practical value; but without special skill and experience in their performance and interpretation the results may be equivocal. Effective treatment of these major tears of the cuff presents further difficulties. In general, the results of operative repair are poor; it seems that simple suture will often be unsuccessful because the tendon is usually degenerate. Possibly attempts by other means to provide a stable fulcrum, whereby the deltoid could take over the sole control of abduction, might be more successful: one possibility would be to establish a new joint surface between the upper end of the humerus and the under-surface of the acromion.

"*Frozen*" *shoulder* presents some of the most baffling of all shoulder problems. For no clear reason, and typically without preceding injury, the shoulder becomes painful and stiff. There is a proportionate limitation of all movements, which are often reduced to as little as 20–30% of the normal range. Yet there is no clinical evidence of an inflammatory arthritis, and there are no radiographic changes. The underlying lesion is uncertain. Reports of the appearance of the joint in the relatively few cases where operation has been undertaken are conflicting. Thus Codman [4] found congestion over the supraspinatus tendon in the floor of the subacromial bursa. Lippmann [5] found adhesive tenosynovitis of the long tendon of the biceps, and believed this to be a causative factor. Simmonds [6] reported chronic inflammatory changes in the musculo-tendinous cuff, and to a slighter extent in the whole of the capsule, but stated that the biceps tendon was unaffected. He believed that "frozen" shoulder could be correlated with degenerative lesions of the cuff. Others, however, regard it as an independent clinical entity. Arthrographic studies [7] have shown defective filling and reduced capacity of the synovial cavity, but the significance of this finding is not yet clear; most observers agree that the interior of the joint itself appears normal at operation.[6] In the face of this conflicting evidence it must be admitted that we have no certain knowledge either of the cause or of the pathology of "frozen" shoulder.

Nor is the relation of the ordinary "frozen" shoulder to the "shoulder-hand" syndrome clear. In the latter condition the development of a stiff and painful shoulder is followed after an interval by similar stiffening of the hand and fingers, which assume a position of flexion and become progressively more useless, with cold glossy

1. Furlong, R. *Ann. R. Coll. Surg. Engl.* 1952, **11**, 300.
2. Nelson, S. *Med. J. Aust.* 1952, ii, 293.
3. Ellis, V. H. *J. Bone Jt Surg.* 1952, **34B**, 513.
4. Codman, E. A. The Shoulder. Boston, 1934; p. 216.
5. Lippmann, R. K. *N.Y. St. J. Med.* 1944, **44**, 2235.
6. Simmonds, F. A. *J. Bone Jt Surg.* 1949, **31B**, 426.
7. Ellis, V. H. Unpublished data.

skin. The elbow and wrist joints remain unaffected. A notable difference between the two conditions is that, whereas the ultimate prognosis of "frozen" shoulder is good, the "shoulder-hand" syndrome may cause severe permanent disability. Whether the shoulder-hand syndrome is closely allied to the common type of frozen shoulder or is a distinct entity has yet to be learnt.

BED REST AND REST ETERNAL

THE more we learn about the human body the surer we are that it should be kept up and doing. The old, especially, should profit by the hymnist's advice and dread the grave as little as their bed; or as much. Dr. Charles Baker,[1] however, in reminding us of the dangers of the bed, is careful also to point out that confinement to it cannot be beaten as a means of forcing the overtired to rest. Few of those sentenced to this form of imprisonment complain much after the first day; for leisure, as we all know, is a drug of addiction. "There may be restlessness for a few days, but then complacency arrives, in the second week laziness sets in, and later the difficulty may well be to get the patient moving again."

But for the old and enfeebled bed rest spells such things as loss of tone in the muscles, decline of muscular coördination, stiff joints, postural deformities, pressure sores, and hypostatic pneumonia; while the slowing of the peripheral circulation favours venous thrombosis and the risk of pulmonary embolism. Even when they begin to get up they may experience a transient "effort syndrome" because the reflex adjustments of the heart and circulation have become sluggish with disuse. After a long period in bed the aged may never fully readjust themselves, even if their minds have not suffered from the diminished mental stimulation which such confinement entails. But by far the worst feature of bed rest in a chronic ward, Dr. Baker says, is the loss of hope of any personal independence, to which is often added bitterness at filial neglect. The geriatricians have achieved a great thing by getting their patients out of bed and moving.

The danger of venous thrombosis is now so well appreciated that surgeons and obstetricians vie with each other in getting their patients early out of bed. Physicians, of course, are not so well placed to apply the principle, but they, too, are less anxious to keep the sick recumbent than they used to be. As Dr. Baker points out, it is not just being in bed that slows the circulation in leg veins: it is the fact that the legs are so often *immobile* in bed. The venous flow, it has been shown, is increased by even very small movements of the feet. Strong normal people kept in bed move their legs, and maintain a normal rate of flow. But patients after operations keep still from fear of pain, and old and feeble people, as often as not, cannot move because the bed-clothes are tucked in too tightly. It seems appropriate to urge once again, as we have often done before, that every patient in a hospital bed should be nursed with a cage over his feet, so that his legs are not pinioned by the weight and tension of their coverings. Nurses are not so wedded to the idea of neatness that they will put it before the well-being of their patients. In a case like this they only need convincing of the value of the measure to apply it; though they will probably not be able to get the necessary equipment without the support of the medical staff. Dr. Baker insists that if patients must remain in bed they should be encouraged to move their feet; but adds that this does not absolve their doctors from the duty of examining the legs for painful spots, localised œdema, or localised pain on movement. "Early thrombosis can easily be missed if we look only at the exposed end of the patient or are too chary of disturbing the tidiness of the lower end of the bed." An active diaphragm, also important in maintaining a good venous circulation, can be ensured by breathing exercises.

He is as convinced as everyone else of the value of bed rest in heart-disease, but offers cogent reasons for not making it absolute. When we are lying, our cardiac output is greater, by as much as a third, than when we are erect. The normal heart, he says, rapidly adjusts itself to recumbency, but this is not so with the failing heart: the patient, when lying, has to cope with increased blood volume and venous pressure, and with relatively hampered respiration. When he is sitting up in bed, with legs extended, his cardiac output is much less, and so is his respiratory embarrassment. But it is a tiring position to maintain, and patients find they sleep best and most comfortably with the body upright in a high-backed chair. He reminds us how patients with left-sided heart-failure ease their discomfort if left to themselves: they prop themselves up with extra pillows, sit up in bed when breathless, and if this is not enough hang their legs over the side—thus diminishing the venous return to the right heart, which is pumping blood into the already congested lungs. In severe attacks they get out of bed and stand up until relief comes, often spending the rest of the night in a chair. "What unquestioning faith they have in us when we insist on treating their complaint by not letting them out of bed at all." It is good practice, he says, to advise them to sleep in a chair, especially in the early stages of treatment; and he emphasises that the best way to treat the acute emergency of pulmonary œdema is to get the patient on to a firm chair. Right-sided failure, with congested neck veins, enlarged tender liver, and general œdema, has usually been preceded by left-sided failure; so the lungs, as a rule, are congested as well. It is safer and more comfortable, he points out, to have fluid in the legs than in the lungs. The patient with right-sided failure should therefore certainly have periods of sitting in a chair. "The few steps to and from the chair and a daily visit to the toilet give the heart little extra work, lessen the danger of pulmonary infarction, and pay a rich dividend in improving the patient's outlook."

Even in coronary thrombosis, he finds, the duration of bed rest may be reduced in mild cases to four weeks; and it need be absolute only during the initial period of shock. After this he recommends the use of a commode in the bedroom, for it has been well shown that this causes less effort and strain on the heart than the use of the bedpan.[2] Patients and relatives, who are apt to fear that death may result from the slightest movement, can be told that coronary thrombosis most often occurs when the patient is at rest, often in bed, and that the reason for rest is to allow the heart to deal with what *has* happened rather than with what *might* happen.

MECHANISM OF PROTEINURIA

SOME textbooks of general and applied physiology still teach, in Cushny tradition, that in health the renal glomeruli deliver to the tubules a protein-free plasma filtrate, and that proteinuria need only be considered in terms of abnormal permeability of the glomerular capillaries. Monographs of renal physiology, however, mention the alternative, or "modern," theory that normally some glomerular filtration of protein takes place and that there is constant tubular reabsorption of filtered protein. Proteinuria could then be due to increased glomerular filtration of protein with saturation of a normal tubular reabsorptive capacity, to diminished tubular reabsorption of a normal protein load, or to a combination of glomerular and tubular defects.

This matter has been debated since the 19th century; but the balance of evidence, reviewed authoritatively by Rather,[3] increasingly favours normal glomerular filtration

1. *Guy's Hosp. Gaz.* 1953, **67**, 11.

2. *J. Amer. med. Ass.* 1950, **144**, 1443; and see *Lancet*, 1951, **i**, 222.
3. Rather, L. J. *Medicine, Balt.* 1952, **31**, 357.

of protein. Dock's [4] experiments with Winton's technique of perfusion of kidneys with ice-cold serum suggest that the glomerular capillaries resemble those of the choroid plexus in filtering a fluid containing some 15–20 mg. of protein per 100 ml. This modest leakage of protein would lead to heavy proteinuria but for tubular reabsorption. The results of analysis of fluid obtained by glomerular puncture in animals have been equivocal on account of technical difficulties; but on the whole they point to glomerular filtration of protein. Injection of proteins foreign to plasma, such as hæmoglobin, leads to their appearance in the urine only after a plasma "threshold" level has been reached—a fact best explained on the supposition that at such a plasma level the tubular reabsorptive capacity has been saturated. Protein reabsorption appears to occur in the proximal convoluted tubule, and may give rise to hyaline droplet formation (athrocytosis) in the tubular epithelium when the reabsorptive mechanism is being overloaded.

One innocent type of proteinuria is that related to exercise. Javitt and Miller [5] attribute this to increased glomerular leakage of protein which, they say, is due to the acidæmia of exercise that is supposed to have a softening effect on the intercellular cement substance of the glomerular capillaries; a potentiating factor may be anoxia from reduced renal blood-flow. The degree of proteinuria is not related to the pH of the urine, which does not affect tubular reabsorption of protein. This is not surprising, since the urine is acidified in the distal convoluted tubule. In 3 normal persons studied by Javitt and Miller, albumin/globulin ratios of exercise proteinuria were less than unity. Obviously, molecular weight is not the only factor in determining passage through the capillary membrane, and thought must be given to such other factors as the relative amounts of each class of protein in the plasma, molecular structure, and molecular electrical charge.

Other types of innocent proteinuria, and also the proteinuria of organic renal disease, require further study along such lines as those followed by Javitt and Miller. Investigators should beware of fallacies, one of which has lately been uncovered by Doxiadis and his colleagues.[6] These workers have proved that physiological proteinuria does not occur in the newborn infant; belief that it did had been based on false results from the highly concentrated urine, containing large amounts of urates, that may be passed in the first week of life.

ALOPECIA AREATA

THERE has been remarkably little progress in our fundamental knowledge of the causes of loss of hair since the description in *Leviticus* of the differences between leprotic and non-leprotic forms of alopecia. We recognise an androgenic alopecia in both males and females: and we recognise loss of hair from various scarring diseases affecting the scalp. But what of alopecia areata? Is it caused by an infection, is it a "trophoneurosis," or is it a symbolic expression of inadequacy, usually sex-based?

Anderson [7] in a study of 114 patients with alopecia areata found that there had been an emotional shock before the onset in 23%, and various degrees and forms of mental disturbance in another 22%. A further 28% had some kind of infection, general and local, or vague ill health before their hair began to fall, but the remaining 27% were apparently in perfect physical and mental health. The condition often affects children, and Brown [8] found that in 300 patients 57% of first attacks occurred under the age of 21, and only 9% over 40. The focal-infection and eye-strain theories have largely been discounted, and opinions now seem divided between the explanation of emotional symbolism and that of a hypothetical virus or toxin which causes a trophoneurosis; but no single theory seems to fit all cases.

Ignorance of the cause leaves treatment in an unhappy state of uncertainty. The rubefacient effect of ultraviolet irradiation applied by a physiotherapist is generally believed to be more effective than a similar result produced by the patient's own efforts with "lin. alb." If this is true it suggests that the kindly presence of the physiotherapist has more influence on hair growth than the remote figure of the doctor symbolised by the bottle on the mantelshelf. Feeny [9] reported that local applications of thorium-X were effective; but other workers have found that, while it succeeds in some patients, others remain unchanged or even become worse. When different people obtain such different results, the influence of enthusiasm and confidence must be weighed on the one hand against casualness and scepticism on the other. Many endocrine substances have been used without success. Walker and Rothman [10] examined 230 patients with alopecia areata, and came to the conclusion that in the overwhelming majority there was no evidence of endocrine abnormality to be found from physical examination or laboratory tests. They nevertheless thought that endocrine factors might play a small part because alopecia areata is often more severe when it begins before puberty; because regrowth may occur during pregnancy [11 12]; and because some examples of alopecia areata begin at the same time as thyrotoxicosis. They had no success with large doses of œstrogen, progesterone, lactogenic hormone, and deoxycortone.

Wilson [13] has now described regrowth of hair in a patient with alopecia areata and in 3 with alopecia universalis 8–10 days after the beginning of treatment with adrenocorticotropic hormone (A.C.T.H.). He concluded that this effect might be due to the influence of A.C.T.H. on inflammatory exudates; to inhibition of an allergen; to increased local blood-supply; or to a specific adrenal hair-stimulating hormone. Dillaha and Rothman [14] have described partial regrowth in 16 out of 22 patients treated with cortisone (100–150 mg. daily). In 14 the regrowth occurred 3–4 weeks after the start of treatment. It was usually only patchy, but sometimes the cosmetic result was satisfactory. The axillæ and the pubis were most resistant to the effects of cortisone. In 3 patients new patches of baldness developed during the treatment. The average duration of alopecia in the failed cases was 11·7 years (with a range of 4 to 20 years), compared with 4·7 years in the successful cases (3 months to 14 years). Alopecia starting at puberty seemed to have a bad prognosis. One patient also had nail changes, and these improved as the hair regrew; but both hair and nails relapsed soon after treatment was stopped. Similarly, Wainger [15] has illustrated successive improvements and relapses in a patient with alopecia universalis during and after treatment with A.C.T.H. and cortisone. Dillaha and Rothman conclude that cortisone may act by bringing about some change in the local chemical *milieu* which perhaps influences sebaceous-gland function or keratinisation. However, they emphasise strongly that they do not recommend this form of treatment for general use.

Regrowth of hair during treatment with A.C.T.H. or cortisone seems to be a direct result of the treatment and not of suggestion, for it regularly begins 3 to 4 weeks

4. Dock, W. *New Engl. J. Med.* 1942, **227**, 633.
5. Javitt, N. B., Miller, A. T. jun. *J. appl. Physiol.* 1952, **4**, 834.
6. Doxiadis, S. A., Goldfinch, M. K., Cole, N. *Lancet*, 1952, ii, 1242.
7. Anderson, I. *Brit. med. J.* 1950, ii, 1250.
8. Brown, W. H. *Brit. J. Derm.* 1929, **41**, 299.
9. Feeny, P. J. *Brit. J. phys. Med.* 1947, **10**, 146.
10. Walker, S. A., Rothman, S. *J. invest. Derm.* 1950, **14**, 403.
11. Waisman, M., Kepler, E. J. *J. Amer. med. Ass.* 1941, **116**, 2004.
12. Bishop, P. M. F., de Mowbray, R. R. *Lancet*, 1952, i, 1258.
13. Wilson, R. A. *Ibid*, p. 646.
14. Dillaha, C. J., Rothman, S. *J. Amer. med. Ass.* 1952, **150**, 546.
15. Wainger, C. K., Cappleman, W. P. *Arch. Derm. Syph., Chicago*, 1952, **66**, 397.

after starting treatment, and it invariably relapses when treatment stops. But these observations do not carry us very far. Is the action on the hair bulb, the blood-vessels, the autonomic nervous system, or the thalamus? Does it involve a virus, a toxin, or an attitude of mind? An effective answer seems unlikely in the immediate future; but at all events the latest news is hopeful, and promising prospects are opened up by the research tools, A.C.T.H. and cortisone.

THE WORLD'S SOCIAL CONDITIONS

RECENTLY we welcomed a small pamphlet entitled War on Want, issued by the Association for World Peace, as "a sober account of world poverty." [1] A large monograph [2] on this subject has now been prepared by various United Nations special agencies at the request of the General Assembly. This deals with population problems, health conditions, food and nutrition, housing, education, conditions of work and employment, and general levels of income and welfare. There are special chapters on social conditions in Latin America, the Middle East, and South-east Asia. Such a great mass of factual information has been assembled and critically examined that the book is likely to become a standard reference work for students of any social subject who are interested in world affairs.

An introduction discusses the effect of modern scientific technology on our outlook. In the basic ethics of all great religions it has always been recognised that the rich must help the poor: now arising "from this deep impulse of human charity and consistent with voluntary help and personal giving" governments have accepted the principle that the rich countries must help the poorer countries to develop their material standards of living. Such well-doing is "enlightened self-interest." All over the world fatalistic resignation to poverty and disease is being superseded by a demand for a better life, made possible by scientific discoveries. This demand is at the back of nearly all the political unrest in the world today. Unfortunately it is only too often exploited by wicked and ignorant men; nevertheless, as this report abundantly shows, there is often real justification for "unrest," which needs to be directed into creative channels.

The chapter on health, prepared by W.H.O. staff, provides striking contrasts. A map shows the present world-wide distribution of malaria, and the results of modern control methods are described. In the Himalayan Terai, in the Uttar Pradesh State of India, there is a fertile tract of over 2000 square miles; here over a thousand years ago the cultivators were driven out by malaria and the jungle was allowed in. Now, however, malaria control has already enabled man to throw back the jungle and so provided thousands of fertile farms for new immigrants. Most of the cost is falling on federal and State governments, but W.H.O., UNICEF, and F.A.O. are providing some material aid in addition to much technological skill. The effects of malaria control on productivity are immense. In Greece D.D.T. has had the effect of adding an equivalent of between 100,000 and 200,000 healthy workers a year to the labour force. The report makes it clear that in the fight against mass diseases, such as malaria, yaws, tuberculosis, and schistosomiasis, most countries need not only more doctors, nurses, and equipment, but also more and better food and educational services to combat ignorance and age-old superstitions and prejudices. The chapters on other social problems must fascinate the medical reader; for they show how much medicine has to contribute and how closely it is linked with technical problems of food-supply, education, industrial welfare, and housing. The report repeatedly illustrates causal bonds between poverty and disease.

The report is concerned more with statements of general problems than with details of methods for their solution. Accounts are, however, given of many successful ventures in scientific international coöperation, which "may be a means of solving problems that appear insoluble when viewed within the frame of national resources: and thereby the vast gap between the more-developed and the less-developed countries may be reduced. Many pioneer projects and demonstrations are under way." The campaign against yaws now being undertaken by several governments in South-east Asia with the help of W.H.O. and UNICEF is an excellent example. The early successes of the technical U.N. agencies (F.A.O., W.H.O., UNESCO, and I.L.O.), though still small in relation to the problems before them, give rise to a subdued optimism, which runs right through the report. At this time, when the failures of the United Nations on the political side are obvious and are widely publicised, we should remember the successes of the specialised agencies in promoting technical advances in many parts of the world. Scientists are developing techniques for international coöperation which politicians may perhaps copy.

1. *Lancet*, 1952, ii, 323.
2. Preliminary Report on the World Social Situation. United Nations, Department of Social Affairs. New York, 1952. Pp. 180. 12*s*. 6*d*. Obtainable from H.M. Stationery Office.

A JOURNAL FOR PRACTITIONERS

IN transforming itself from a weekly into a monthly the *Medical World* [1] has become a very different journal. It ceases to be the official organ of the Medical Practitioners' Union, and its editorial pronouncements will henceforth be independent. A supplement expounding the policy of the union and edited by its general secretary will be sent to every member with his copy of the *Medical World*; but the journal itself, which now bears the aspiring subtitle "the journal of general practice," will be addressed to a wider audience. With the coming of the National Health Service, the issues before the practitioner have become less controversial, but are no less important: "general practice in Britain is about to find itself in the forefront of medical and social evolution," and there is much need to describe and discuss the merits and demerits of new patterns of practice and new ways of organising the work. The *Medical World* also wants to encourage research by publishing the original work of practitioners:

> "It is to fill a gap in British medical literature, to provide a journal written for and, as far as possible, by general practitioners. That is not to say that the specialists and consultants will be excluded from its pages; but they will be admitted as equals, with experience and knowledge to exchange, and not as superiors to pontificate and condescend."

The journal sets its tone in a series of able editorials, written in this vigorous way, and if its contributed articles maintain the level they reach in the first number it will attract and keep a great many interested readers. The accessory items, such as its letter from France, its Impressions of Parliament, and its literary musings, are highly readable—which some authorities regard as the first journalistic virtue—and it offers solid benefit in such articles as the one describing the group practice at Skipton which has lately been visited by the Minister of Health.[2] Here a main surgery was constructed in 1939 from a row of four small houses, and the five partners are now able to tell us how, with the aid of seven ancillaries (definitely excluding wives), they have preserved both their standards of work and their private life. Certainly a most encouraging example, and one which justifies the editorial belief that "we have certainly not heard the last word on the planning of general practice by practitioners. This is not the end but the beginning."

1. Edited and distributed from 55, Russell Square, London, W.C.1. Annual subscription £2 2*s*. (post free). Single copies 4*s*.
2. *Yorkshire Post*, Jan. 5, 1953.

Special Articles

SOME PRACTICAL CONSIDERATIONS IN THE CARE OF THE OLD*

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"You are old, Father William," the young man said,
"And your hair has become very white;
And yet you refuse to remain in your bed.
Do you think, *at your age*, it is right?"

THE attitude of doctors and administrators towards sick and infirm old people has been discussed many times in recent years. Reports from various parts of the country reveal what can only be described as a state of widespread apathy for the plight of old people in need of medical care. These reports emphasise the need to provide opportunities for medical students and doctors to work for a time, at any rate, among old people. Not the least important advantage of this kind of experience is that the doctor becomes aware of the far-reaching effects of the social policy of a community on the standards of medical practice. In my own experience of institutions for old people, I have heard the remarks that indicate the unimaginative outlook. Here are some of them:

"These patients are sent here to die; nothing can be done for them. If it could, it would have been done in the hospitals they came from."

"Nothing must be done for them, for the nursing staff are employed on that understanding, and they will refuse to work here if any treatment is begun."

"If the lay administrators could sign death certificates there would be no need for a doctor."

"If you make this place too attractive, too many will want to come in."

"There is no use in re-educating the patients to walk if they cannot be discharged, for no hospital beds will be released thereby."

"Anyhow they have been in bed too long, and are all confused and senile."

"The food cannot be as bad as that, or someone would have complained before."

"Clothes cannot be supplied to hospital patients; anyone who is fit to be out of bed is fit for Part III accommodation."

A Survey in a Hospital

A survey at a former poor-law institution was made between September, 1949, and February, 1950, and concurrently reforms were proposed. At the time of the survey there were 622 patients in the hospital, 207 women and 415 men. They could be grouped in the following categories:

(*a*) Those who could walk but were not fit to live alone or in part III accommodation: 79 women (38% of the 207 women) and 145 men (35% of the 415 men).
(*b*) Those who needed constant help, or re-education in walking: 60 women (29%) and 176 men (42%).
(*c*) Those who were unlikely to walk again and needed nursing care: 68 women (33%) and 94 men (23%).

Only 45% of the men and 30% of the women had been in the hospital for less than a year: that is, the majority had been an unconscionable time a-dying. How much longer were they likely to live? The fact that elderly people are likely to die within the next ten, twenty, or thirty years seems to be no good reason for leaving them untreated—unless we wish to follow Osler's jocular suggestion that everyone should be quietly disposed of with chloroform on reaching the age of 60.

In view of the régime to which the nurses had become accustomed, it was to be expected that they would at first be sceptical about proposed reforms. They echoed —not smugly but regretfully—the prevailing hopeless note, saying: "These patients have been in bed too long for anything to be done now." They feared to be held responsible "if anything happened" to a patient when up (anything that happened as a result of years in bed was a venial offence), and regarded "letting the patient fall" as a nursing crime to be avoided at all costs. To some people it is axiomatic that falls are always the result of a nurse's carelessness—though in point of fact they can happen even when a nurse is standing close to the patient's chair. The nurses had also noticed the transient spells of unconsciousness in the elderly which are discussed below, and were reluctant to allow patients out of bed except on the most definite and specific instructions from the doctor.

In that they were perfectly right. There are some who regard rehabilitation as a nursing affair. "Tell the nurses to get them up, that's all." But it is not the business of a nurse to decide that a patient is fit to get up, or how he should be got up, and for how long. If an elderly patient who has been in bed for years is suddenly dragged out and stood on his feet, he may become unconscious, or feel so ill that he subsides on the floor and makes no effort at all.

A doctor, about to tackle Mrs. McA, was told that she had been up once before and had been most uncoöperative: she had been lifted out of bed and helped to her feet, and—according to the ward sister—she just sat on the floor and screamed. According to the patient she felt "dreadful" and thought she was going to die. This patient had been eight years in bed, and her hæmoglobin was only 6·3 g. per 100 ml.

The nurses, however, as soon as they saw what could be done, and realised that it was for the good of the patients, offered no opposition to the new plans, and their attitudes ranged from interested toleration to extreme enthusiasm. Even the most conservative sisters were soon uttering the accepted dogmas of geriatrics. The sister in whose ward rehabilitation was first begun possessed a fine pioneering spirit, and the policy of "let bad alone lest worse should befall" was obviously abhorrent to her nature. In spite of the most distressing criticisms levelled at her from some quarters she never wavered in her enthusiasm and loyalty. The nursing staff was far too small for a geriatric unit, and unsuitably distributed; the nurses were much hampered by domestic duties of polishing and dusting, and the lack of any of the usual nursing aids, such as trolleys; and they had—until the patients were regrouped in October, 1950—very difficult heterogeneous wards, with a further admixture, in winter, of acutely ill adults and infants. But by their brisk and intelligent coöperation they made possible far greater progress than would ever have been accomplished by twice the number of apathetic nurses.

Given the requisite enthusiasm, many of the initial steps in rehabilitation can be taken without waiting for elaborate equipment or physiotherapists—this hospital of course had neither. The absence of certain basic necessities, however, was an almost overwhelming drawback. The shortage of clothes, armchairs (there were neither padded chairs nor cushions), and outdoor shoes (which are much better than slippers for those relearning to walk) greatly retarded progress. The cold draughty wards, the slippery hospital floors, and the lack of handrails and wheel-chairs made it unnecessarily difficult to induce the patients to make a real effort. When rehabilitation first began there were not even enough dressing-gowns to go round, and the patients had to be got up in relays. When a dressing-gown went to the laundry several patients had to be kept in bed until it returned. Those who were up had to take turns of the few armchairs. Although there had been some improvement since September, 1949, when the general survey was begun, in the first half of 1950 there were only 27 armchairs and 61 frocks available for 108 female "up"

* Based on a thesis submitted to the University of Glasgow for the degree of M.D.

patients, and 33 armchairs and 176 suits available for 151 male "up" patients. There were no wheel-chairs, apart from uncomfortable dilapidated bath-chairs. The wards were as cold and draughty as ever, and fires were pronounced unnecessary for people who should either be in bed or in part III accommodation.

These circumstances were easily reconciled with the widespread desire to preserve at all costs the status quo. But the work still went on; the "up" patients increased daily in number, and were to be found even in the wards of the most conservative and fastidious sisters. Hardness is seldom encountered among nurses who actually work with patients: what is proved to be good for the human beings under their charge is incontrovertibly good in their eyes, and they do it with all their might.

The "Wee Turn"

The elderly are liable to sudden transient episodes of unconsciousness of varying duration, whose occurrence tends to cause the patient to be kept in bed. The different types described below may not be varieties of the same condition with the same ætiology (whatever it is), but they have been seen in the same patient at different times.

The briefest variety usually occurs when the patient is sitting in a chair; he is noticed to look vacant for a moment and may drop anything he is holding, then quickly returns to normal—a description suggestive of petit mal. Or he may become very pale, lose consciousness, and slide off his chair; but recovers immediately and completely when returned to bed, knowing nothing of what has happened. A recent meal, getting up in the morning, proximity to the fire, a warm close atmosphere (as during a film show), or excitement (at film show or ward party), may be precipitating factors; but attacks indistinguishable from these may occur on getting up for the first time after many years lying in bed, in gross anæmia, severe nausea, vomiting, diarrhœa, or internal hæmorrhage (confirmed by the subsequent appearance of hæmatemesis or melæna). Sometimes a patient may have several such attacks on successive days and then be free from them for weeks.

There are also attacks of longer duration than those just described. The patient remains unconscious for a longer period and recovers more slowly. He is very pale, sometimes slightly cyanosed, with cold extremities and feeble or imperceptible pulse, but neither tachycardia nor bradycardia. The breathing is quiet; there is no twitching, and no evidence of a lesion of the central nervous system. Sometimes there is incontinence of urine or of a very loose stool. He usually recovers gradually when returned to bed, and improves if given brandy as soon as he can swallow. He is as a rule rather vague at first, but may say that he felt dizzy or very sick, and sometimes vomits on regaining consciousness. A few patients, however, with exactly the same signs, die a few minutes later, before or after regaining consciousness, without further clinical sign or symptom—presumably of a coronary thrombosis.

Occasionally the appearances are exactly as above, but the patient does not immediately recover consciousness, though the pulse becomes palpable again and the colour improves. On examination he is found to have a definite flaccid hemiplegia. The blood-pressure is usually at the patient's normal level—of about 160/90 mm. Hg. The appearances are those of a cerebral thrombosis, but the breathing is quiet, not stertorous. The patient may remain unconscious for as long as twelve hours, then regains consciousness and is found to have no evidence whatsoever of a hemiplegia; he is usually up and about as usual within twenty-four hours. This may be repeated in the same patient several times.

Transient hemiplegia is also seen, accompanied by unconsciousness, flushing of the face and twitching of one side of the body; in such cases the pulse is unaltered. These patients often develop a permanent paralysis after several such attacks.

There is also the sudden weakness, especially of the legs, which occurs when the patient is either standing or sitting and which makes him completely helpless; it is not accompanied by loss of consciousness or alteration in the volume of the pulse, but he sometimes becomes rather pale, and reports that he felt "completely done." Such attacks are usually transient, but are on occasion the reason why old people living alone are found on the floor having lain there many hours or even for days, because they were unable to rise.

The following case-histories illustrate some of these attacks.

Case 1.—Mrs. B, aged 84, was a very pale woman with a hæmoglobin level of 7 g. per 100 ml. She had several brief attacks of unconsciousness, usually on rising in the morning, with quick recovery on return to bed. Since her anæmia has been corrected she has ceased to have such attacks.

Case 2.—Mrs. C, aged 76, has a slight right hemiplegia. For four years she has had brief attacks of unconsciousness when sitting up in a chair; she becomes pale and pulseless and recovers gradually when returned to bed. These attacks were the reason for her being kept in bed for many years. Often she has none for weeks or months, then several in one week. She is not anæmic and her blood-pressure is 150/90.

Case 3.—Mrs. D, aged 80, on several occasions became very pale when sitting in a chair after dinner. Her pulse was impalpable and her extremities very cold. She recovered gradually when returned to bed but was rather vague in manner; she could only say that she felt very sick; on one occasion she was doubly incontinent. She eventually died suddenly one night when convalescing from pneumonia.

Case 4.—Mrs. E, aged 72, is a diabetic and is blind. One day when sitting in a chair after dinner she became deeply unconscious and fell from her chair. She was very pale, but not cold, her pulse very feeble (70 per min.) and her breathing quiet. There were signs of a complete flaccid left hemiplegia. She remained unconscious for twelve hours; twenty-four hours later she appeared to have recovered completely; there was no sign of any paralysis and she was able to walk as before. The blood-sugar at the time of the attack was 200 mg. per 100 ml. There has been no recurrence (in 12 months).

What is the ætiology of these attacks in the elderly? Some are so transient that little or no investigation can be made. The pallor, the cold extremities, and the imperceptible pulse suggest a primary cardiac condition (possibly caused by vagal inhibition) with secondary cerebral anæmia leading to unconsciousness, and in some cases signs of paralysis. The patients have no obvious signs of heart-disease, their blood-pressures are not excessively high; their pulses are of a normal rate and rhythm.

Sir Thomas Lewis (1946) divided "attacks of fainting" into the following:

Postural Faintness.—Temporary giddiness or transient loss of consciousness on rising, usually in middle-aged or elderly people, especially on rising from a chair after a full meal in an overheated room.

Vasovagal Attacks.—Seen especially in the young in poor health, fatigued or fasting. It is a brief attack causing a sinking feeling in the abdomen, nausea, loss of consciousness, pallor, and imperceptible pulse. A similar attack occurs in those with aortic regurgitation.

Cardiac Syncope.—Rare compared with the other causes of fainting. He considered that most are cases of chronic heart-block; a few are due to temporary heart-block; and there are a few rare cases in which the whole heart stops beating for a few seconds. Sudden death is probably due to fibrillation of the ventricles.

Of the differential diagnosis of fainting he wrote:

"Postural giddiness and vasovagal attacks in middle-aged or elderly people are apt to be attributed to cerebral arterial disease and regarded as attacks premonitory to apoplexy; such cases are differentiated by the absence of profound pallor or heavy sweating, the unaltered pulse, and the association of loss of memory, paresis or aphasia."

Walshe (1946) states that the term "vasovagal" was originally coined by Gowers for attacks (described to him by patients) of a growing sense of precordial and abdominal discomfort and a feeling of impending death; the extremities and the face grow pale but consciousness is not lost. Nothing is known of the heart action in these attacks which develop slowly and pass off slowly, lasting as long as half an hour. Pickering (1951) writes that he finds it particularly difficult to accept the idea of cerebral arterial spasm to explain attacks of transient paralysis in patients with essential hypertension. There is usually no precipitating factor and *consciousness is not lost*. He has seen similar attacks in patients with mitral stenosis and auricular fibrillation, which may be attributed to blockage by an embolus; therefore similar attacks in hypertension may also be due to organic occlusion of a cerebral artery—by thrombosis, or hæmorrhage into the wall, or by sudden expansion of the wall (arteriolar necrosis). Further investigation of the "wee turn" is obviously necessary.

Falls in the Elderly

There are many causes of falls in the elderly and the results of even a very minor fall can be serious. Some complain that they could "trip over a pin": this may be due to incoördination, weakness, or shuffling gait, but the inability to recover balance quickly—as a younger person would—is the real disability. Slippery or uneven ground and poor vision may also add to their troubles, so that they feel very unsure of themselves; and the exclamations of well-wishers to "watch" and "take care" only add to their anxiety. Quite often a patient, when questioned after a fall, will admit to having felt off-colour and shivery all day, and is found to have pneumonia—the cause, not the result, of the fall. Some find that their unsteadiness increases in confined spaces, as in parkinsonism, or after prolonged sitting, or in unfamiliar surroundings. Sheldon (1948) found vertigo an important and distressing symptom; it was present in one form or another in 51·6% of his cases. He suggests as causes, changes in blood-pressure, and diseases of the ear, but considers that "senile degeneration of the labyrinth" is most likely, especially as the incidence increases with age. This vertigo may be severe enough to make standing impossible, and is often induced by looking up. This is also noted by Critchley (1948). Alcohol and sedatives naturally increase any tendency to unsteadiness. Platt (1950) emphasises that dizziness is not invariably present in hypertension; it is not rotatory as in labyrinthine upset, but is more a light-headedness after stooping. Sudden extreme weakness, with or without unconsciousness, usually occurs at rest but may result in the patient's falling off his chair. Similar attacks are common where the stool type of commode is used; the fall may be due to loss of balance, or to a sudden cerebral anæmia caused by straining or sudden defæcation. Another cause of falling is sudden weakness of the legs, similar to that at the onset of cerebral thrombosis but affecting the legs only and of very brief duration. Though remaining fully conscious, the patient may be completely helpless and quite unable to rise. Sheldon suggests that the whole central mechanism subserving postural tone is liable to sudden failure. More definite causes of falling are the sudden onset of cerebral hæmorrhage or thrombosis with immediate onset of paralysis and in some, a complete loss of consciousness. A substantial proportion of such attacks pass off in a few days.

Of the patients at the hospital I have been describing 5% complained of dizziness or unsteadiness. Sheldon found a liability to fall in a third of his cases, and that it increased with age and was commoner in women; the younger age-groups complained of a feeling that they might fall.

Often a fall, especially in the street, results in admission to hospital; this was the original reason for admission in 8% of the females and 6% of the males in the hospital at the time of my survey. McEwan and Laverty (1949) found falls to be the cause of admission in 6% of their cases and a liability to falls in a further 4%. Only a few of the patients admitted after a fall were found to have some definite lesion, such as hemiplegia or fractured femur; but all except a very few were apparently destined to languish in bed for the rest of their lives. Certainly, as Sheldon remarks, a fall may precede a general break-up. But that is a terminal condition; and it is only too common to find a patient who fell ten years ago, and who has no demonstrable lesion as the cause or result of the fall, still confined to his bed.

When rehabilitation began a few patients objected to getting up lest they might fall; but it was usually found that relatives or nurses had advised staying in bed. Such excessive caution is partly due to humane motives, but partly to that fear of responsibility which has been alluded to before. True even a simple fall may be disastrous for the elderly patient; but it would be an even worse disaster if fear of falling were regarded as a good reason for keeping so many people in bed.

Treatment of Incontinence

It is easier to prevent incontinence than to cure it once it has become habitual. A patient who finds his incontinence accepted by the nurses comes to consider it inevitable, and ceases to try to prevent it. For that reason a patient should never be told that he is necessarily incontinent because he has had a stroke. Though Thomson (1949) asserts that there is general agreement that incontinence cannot be avoided by bedpan rounds at frequent intervals, there are some patients who do remain continent if given a bedpan at frequent regular intervals or immediately on asking. If the patient is incontinent at night, he should be wakened some time before the incontinence has occurred and encouraged to pass urine. It is always worth while to try the effect of reducing the fluid intake in the later part of the day; though not always effective, this expedient makes all the difference in some cases. Some patients would benefit if a bedpan were offered not only after meals but before meals. An adequate number of bedpans and urinals is essential, for some cannot pass urine to order. Male patients can often be kept continent if there is a urinal within easy reach and if care is taken to empty it frequently. The urinal holder described by Ingham (1951) should be more widely used. Patients of either sex may find the bedside commode easier to use than the bedpan, even if they have to be lifted out of bed. It is recognised that the bedpan is difficult to use in bed and it has been proved that patients expend more energy on it than on the bedside commode (Benton et al. 1950). Malcolm Donaldson (1948) noting that his own device of a bedpan below the bed with a special mattress and drawsheet is considered too elaborate, feels that the bedpan should be redesigned to make it deeper and more stable.

A rubber bedpan seems ideal, but is not popular with nurses because of the difficulty of cleaning rubber and its perishable qualities. The use of a bedside commode is condemned by some as being æsthetically unpleasant. But where there are feeble patients with frequency and precipitancy, the presence at the bedside of a commode, which they can manage to use unaided—without having to attract the attention of a nurse or make their way to the toilet—prevents much incontinence, especially at night, in understaffed wards; and also allows the patients to preserve some feeling of independence. For those who are feeble and slow at walking, the thought of having to walk some distance to the toilet, perhaps along a cold passage or up or downstairs, makes

them delay going until it is too late. Many patients at our hospital were admitted incontinent from part III accommodation for this reason, but were perfectly continent in hospital. Toilets should therefore be easy of access and warm, and there should be sufficient hand-rails on the way to them. The use of commodes for semi-ambulant patients during the day should be avoided if possible; they should be helped to get to the toilet or wheeled in the Bohmansson toilet chair (Bohmansson and Malmros 1947). Ideally all commodes should be permanently screened, but this arrangement would bewilder many of the frail elderly, and some would trip over the feet of the ordinary ward screens, or try to support themselves by holding on to them. Nevertheless it may be a fact that certain patients are deterred from using commodes because of the lack of privacy.

In patients with fæcal incontinence, examination may reveal a loaded rectum, causing retention with overflow; repeated enemata should then be given until the bowel is clear (Cosin 1947, Warren 1950). For those who are regularly incontinent of fæces, some ward sisters find that a regular weekly enema is useful (advised also by Adams 1949 and Amulree et al. 1951); apart from one day there is little soiling; it may however be several weeks before the benefit is apparent. The weak and frail cannot be treated in this way, for some of them become cold and collapsed after an enema. For those who, in spite of routine enemata, have filthy habits and who cannot be got out of bed, sedatives may be the only possible form of treatment; patients of this type who are up and about should be kept in the ward if possible as their habits are often better in public than in the privacy of the toilets. There are also those who have no reason to be incontinent and appear perfectly sensible: they sometimes improve after a serious talk during which extreme disgust is shown and the question of their sanity raised. It is important that such patients should not be mixed with the very degenerate as they seem to take the view that they have as much right to be incontinent as the others. This has been noted also by McEwan and Laverty (1949).

Patients who suddenly become incontinent of urine should be examined to see if the bladder is distended, or if they have a urinary infection. Though in some the treatment of a urinary infection does not alter the incontinence, there are many in whom the incontinence is simply a result of frequency and precipitancy, and the pain caused by trying to suppress the desire to micturate. In some patients a week's course of a sulphonamide is sufficient to stop the incontinence, even though the infection microscopically and bacteriologically persists.

Those who become incontinent as a result of a general infection, cerebral thrombosis or cardiac insufficiency, should not be relegated to incontinent wards, as the condition is often only temporary; and in fact the cessation of incontinence usually indicates general improvement. Wilson (1948) found that many cases improved as a result of gradual distension of the bladder with fluid and inhibitory re-education training. This, however, requires a coöperative interested patient, anxious to overcome the distressing disability. Wilson quotes Allen as writing in 1733 that "in old persons incontinence is altogether incurable unless hot baths relieve them."

Many expedients devised to cope with the problem of incontinence are purely palliative and do not constitute a cure. They accept and in fact condone the patients' failure to remain continent and are intended to make things easier both for the patient and for the nurse. In the male patient, the urinal can be strapped between the thighs. This may lead to excoriation if the skin is not washed often enough. Amulree et al. (1951) recommend condom drainage in men, either in bed or up in a chair. Chapel (1951) describes a modification of this as the 'Simplic' bed incontinence appliance. Incontinence appliances such as the "frequency bag" for ambulant male patients can be of value if the patient is intelligent and of clean habits.

Incontinence appliances for women are usually unsuccessful, and cause pressure sores and areas of excoriated skin. Some who have merely a little dribbling benefit from a napkin, but if there is too much the skin again suffers. Amulree et al. (1951) advised sitting on a commode chair on a rubber ring; again there is the difficulty of giving the skin adequate attention.

Many drugs have been tried for the relief of incontinence—usually of the belladonna, ephedrine, or muscle relaxant type, but without consistently good results (Brocklehurst 1951).

Fortunately, getting the incontinent patient out of bed usually stops the incontinence. Cosin (1947) remarks: "Get them up in a suit of clothes, sit them up to the table at meals, take them to the lavatory at frequent intervals—and they will relearn the habits of childhood." Adams (1949) states that most respond when up, even if only in a chair, though the incontinence often recurs at night. Crockett and Exton-Smith (1949) found that incontinence largely disappeared with the awakening of the patients from a state of mental apathy.

At our hospital these findings were confirmed. Only a few patients were occasionally incontinent when up, and most of these were unable to walk; and instead of being very wet, as in bed, were merely a little damp. A few were incontinent when they were assisted to rise from a chair or when they failed to get to the toilet in time. Those who forget should be taken frequently and regularly in spite of protests. Incontinence in bed at night usually persists for a longer time, but with increasing mobility and lessening of apathy this too disappears. The few "accidents" that occur in the initial stages of rehabilitation are apt to discourage the nurses. But soon, forgetting this initial prejudice, they begin to tell the doctor that *of course* such and such a patient is not incontinent when up. Victory may be regarded as won when a nurse volunteers the information that "We were so short of staff at the weekend and the clean linen was almost finished, so we just *had* to get the patients up." In one ward where formerly 48 drawsheets and 48 short gowns had to be sent to the laundry every day, only 11 drawsheets and 5 short gowns were used daily after four months' rehabilitation of the patients.

Of 58 female patients who were always incontinent (31 doubly) in bed, and who are now up in chairs or walking about, 52 are never incontinent when up; 6 are occasionally incontinent of urine when up; 23 are completely continent even in bed and asleep.

It has been found that it is usually those who are unable to walk who are incontinent when up; and a good nurse will often blame herself and say that she was too busy to assist the patient at the right time. Those who remain incontinent in bed have either not been ambulant for very long or are of the bovine apathetic type.

THE BROCKLEHURST BED

The Brocklehurst bed accepts the incontinence as incurable, and makes a virtue of immobility. The patient must be able to lie flat on his back, and must be sufficiently helpless or apathetic not to roll or turn from side to side or shift his position up or down; he must not have more than a slight degree of contracture of the lower limbs. Once the principle of rehabilitation has been accepted, it is found that there are remarkably few patients with the above qualifications; and most of those who are irremediably bedridden and incontinent have contracted knees. These will in any case become fewer as the teaching of geriatrics advances.

For suitable patients the procedure is as follows :

The patient lies on his back on a 'Dunlopillo' mattress placed on three adjustable wooden sections which have a concavity made to suit the curves of the body. The perineal region lies over a hole in the rubber mattress, and all excretions pass through this hole by a funnel to a receptacle placed on a rack below. If the patient remains in position there should be no soiling of the rubber surrounding the hole, and the patient's skin should never be in contact with his excreta. Thus the drawsheet can be given up, and with it the sluicing of the soiled linen ; but the patient's back has to receive the usual four-hourly attention from the nurses, and the funnel has to be cleaned. If the patient does alter his position, the rubber may have to be washed each time. Some apparently completely helpless patients even succeed in getting their hands soiled, and their habits make necessary a complete change of linen and the washing of the whole mattress.

THE ARNOTT GOWN

The problem of coping with the elderly bedridden patient who constantly and repeatedly contaminates the hands with fæces is of serious moment to nurses. Many such patients appear to be perfectly sensible and agree when remonstrated with that their habits are foul. In some hospitals the device is used of making them keep their arms outside the bedclothes, but this cannot be done unless the wards are reasonably warm and there has to be sufficient staff to enforce the rule. For patients who are sensible enough, occupational therapy is of benefit as a means of keeping their hands employed. Some nurses apply a drawsheet like a baby's napkin, but the persistent patient can circumvent any such barricade, and it has the further disadvantage of acting like a kind of fæcal poultice, causing the skin of the back to deteriorate. The use of sedatives is effective and justifiable in the insanely filthy, but the doses have to be high ; in fairly sensible patients sedatives do more harm than good and by causing mental confusion give them some excuse for their habits. The weekly enema is found to be of great benefit and prevents *constant* soiling in those who are well enough to stand it. Sister A. Arnott has devised a modification of the ordinary hospital nightgown, which can be used in an ordinary bed or with the Brocklehurst bed, and this has been completely successful (Arnott and Nisbet 1952). When wearing this gown, the patient feels much warmer and her hands remain clean.

PREVENTION OF SMELL

Some of the people who live or work in the ward may become accustomed to the smell of an incontinent ward, but not all do ; and certainly visitors to the wards are bound to be disgusted if measures are not taken to deodorise the atmosphere. A great deal can be done by the regular, frequent, and complete changing of linen and washing of the skin which is carried out in a well-run ward. But even so there are bound to be times when some smell is unavoidable ; and it is at its worst just after a "purgative night" or an "enema day," when the bowels of many patients move at about the same time.

The odour of fæces appears to vary considerably in different patients. Nurses report that some patients always have extremely malodorous stools ; in others they are offensive only after some digestive upset or when the stools are loose. Attempts to overpower the smell by spraying the ward with some strongly scented liquid are not as a rule very effective. On the contrary, the combination of an offensive odour with a perfume is often particularly sickening. Adequate ventilation is important, but elderly patients seem to have a curious dislike of open windows. The use of the Bohmansson toilet chair cannot solve the problem in the incontinent vegetable type of patient, or in very contracted or very heavy patients who cannot easily be got out of bed. One solution appears to be to fix the malodorous gas, as with Prof. Stanley Alstead's deodorising device, the charcoal blanket (Alstead 1942). But that unfortunately is not suitable where there is such danger of its being soiled. Moreover, fæcal odours are largely attributable to the presence of sulphuretted hydrogen, and gases with a low molecular weight and high degree of volatility, such as this, are not readily adsorbed on activated carbon. Ammoniacal odours, too, easily penetrate a screen of activated carbon, and the charcoal blanket is therefore of no value in minimising the nuisance of this particular kind of smell from incontinent patients. Chlorophyll tablets, taken by mouth, which are said to destroy the smell before it reaches the open air, are still on trial.

Retention of Urine

In the treatment of retention of urine in the male a few of the more domestic procedures should be carried out before catheterisation is attempted, or the patient transferred to hospital. Getting the patient out of bed, hot applications to the lower abdomen, hot drinks, hot baths, the reduction of a hernia, and the administration of an enema should all be tried. Carbachol has sometimes an effect but is considered inadvisable when there is much distension and the prostate is enlarged. When these measures have failed, the treatment depends on the ease of getting the patient into hospital and the type of treatment advised by the surgeons there.

Unfortunately at our hospital there was no close link with a urological surgeon, and when emergency admission was impossible, catheterisation had to be carried out to relieve the patient's symptoms. Once he had been admitted to a surgical ward, he returned only too often with a suprapubic cystostomy.

Wilsen Hey (1946) says that the suprapubic tube should be relegated to the museum of medieval prostatectomy, and advocates primary suprapubic prostatectomy as being the only clean approach to the prostate. He thinks that slow decompression is not only harmful but also unnecessary and that postoperative uræmia is due to infection. He advises that the patient should be out of bed every day after the operation even if only for a few minutes. Walters (1948), too, advises immediate prostatectomy for urinary retention. He states that there is no need for gradual decompression with its dangers of infection, either by catheter or suprapubic tube.

Riches (1949), however, advises gradual decompression to avoid intrarenal hæmorrhage. (A restless patient, confused by pain often disconnects or removes the catheter.) He regards suprapubic catheterisation as better than cystostomy and prefers a two-stage to a one-stage operation. He states that the mortality should not exceed 5%.

Stewart (1949) reports on 1960 prostatectomies with a 3·01% mortality. He describes catheterisation for acute retention after the injection of sterile water-soluble lubricant ; as an alternative he suggests suprapubic aspiration, and he believes that repeated catheterisation has no place in modern treatment. Prostatectomy in those suffering from cerebral softening is apt, he says, to cause further mental deterioration. But we can add that suprapubic cystostomy, too, undoubtedly leads to mental deterioration.

Jacobs (1948) holds that the establishment of permanent suprapubic drainage as a method of relieving prostatic obstruction is highly undesirable and indeed must be regarded as a confession of failure. It may be used as a temporary measure while the effects of renal impairment are treated. He describes the numerous methods of prostatectomy—suprapubic, retropubic (Millin), Wilson Hey's immediate prostatectomy, and the transurethral route. In a review (Jacobs 1951) of 500 cases of retropubic prostatectomy he found a 6% mortality ; in the 80 (16%) patients over the age of 75 the mortality was 8·7%. He reports an excellent functional result with ease of micturition, clear urine, complete control, absence of residual urine, and little nocturnal disturbance.

This selection from many references gives some idea of the number of methods that can be employed, with excellent results, without having resort to suprapubic cystostomy. Admittedly these patients with

cystostomies do not figure as operative deaths: they are discarded to chronic institutions, still attached to the bed by means of tube-and-bottle. They endure an existence made wretched by the debilitating effects of a chronic urinary infection and the repeated pain of bladder washouts and changing of tubes, in an everlasting smell of heavily infected urine and rubber tubing. Their whole life becomes centred on the wound and the tube; their habits deteriorate; they gradually curl up, often under the sheet, and usually die within a year of operation. Surely it would be preferable to give such patients a chance of survival, even if it were only a slight one. It is possible to get a few of them up soon after operation with a special belt and bag, and train them to look after it themselves in a hygienic manner. They may even go home for a time and have the tube changed by a district nurse; though they usually return with symptoms of ascending infection and uræmia.

Case 5.—Mr. F, aged 69, in part III accommodation, found difficulty in passing urine one morning, but did not mention it to anyone, because he was very anxious to go out on pass. It was a very cold day and he had several drinks "to warm himself up." He returned at night with acute retention of urine. A hot bath and an enema gave no result and he was transferred that night to a surgical ward in another hospital. Five weeks later he was returned to our hospital with a suprapubic cystostomy. He was kept in bed to allow the tube to drain continuously. His habits deteriorated. When seen six months later his knees were contracted, his urine heavily infected, and bladder washouts and the changing of the catheter were causing him much pain. He died nine months after the operation, with signs of uræmia.

Fractures

Flemming (1951) states that the rules governing the treatment of fractures in the old do not differ from those universally applicable to the treatment of injuries in people of all ages. Too often it is found that a lower standard of treatment is given to the old than to the young, because it is not thought worth while to restore imperfect function. He points out that the object of the surgeon is to restore to the patients that degree of activity which they enjoyed before the accident, and not some measure of activity which they enjoyed many years earlier: it is wrong to assume that, because they cannot be made fit to walk three or four miles, there is no point in enabling them to potter about their room and do an occasional bit of shopping; and there is no justification for fobbing off the elderly with second-rate therapy. Besides, if the patient enjoyed only a very limited range of activity before the accident, he cannot afford to lose any of it. On the other hand treatment must not be too academic. Thus, in general it is a sound rule not to allow weight-bearing in a fractured femur after pinning until the bone has united; but this delay can render an old person bedridden.

Another reason often given for refusing proper treatment is that the patients occupy much-needed beds for a long time, and may never recover sufficiently to leave. Yet if they are left untreated, they take a very long time to die. They are not, as is so often stated, overwhelmed by hypostatic pneumonia; they linger on for months in a state of suspended but noisy animation. Of the last 50 inpatients (over the age of 75) whom Flemming had treated for fractures, only 2 failed to return home. The argument that they do not stand an anæsthetic is completely unfounded. A patient has to be far tougher to lead a useful life with a painful unreduced fracture than to withstand the stress of reduction; and patients left with untreated dislocated shoulders and Colles fractures develop nerve palsies.

The commonest fractures in the aged are intertrochanteric and pertrochanteric fractures of the neck of the femur. Flemming advises skeletal traction with a Steinmann's pin through the crest of the tibia; or as an alternative a triflanged nail with vertical plate; this second operation is moderately severe and he reports that the results are no better than with traction, except that the patient can be got out of bed sooner. But he considers that each case has to be judged on its own merits. He emphasises that it is very important to make every effort to return old people to their homes; in general hospital wards, they become noisy and deteriorate mentally and physically. Because fractures of the femoral neck are common in the elderly and because they often fail to unite, it has been quite wrongly assumed that fractures of long bones in the old will not join.

Cosin (1947) thinks that an operation for a fractured femur produces less shock than being bounced on and off a bedpan several times daily and having the bed-linen often changed. He states that immobilisation is a waste of the nurses' time, and causes an increase in joint stiffness, respiratory complications, and venous thrombosis. Many other references are available advising operation and discussing details of technical procedure.

The following case-histories of fractures in patients are instructive:

Case 6.—Mrs. G, aged 80, fractured her femur two years ago; no treatment was carried out. Now both her knees are contracted; she is doubly incontinent and apathetic though she remains sensible; she often declares that she wishes she were dead.

Case 7.—Mrs. H, aged 70, fractured her femur ten years ago; no treatment was given and she was bedridden until 1950. She has no contractures but there is 2 in. shortening of the affected leg. She was gradually mobilised and supplied with a patten to correct the shortening. After one year's hard work, she was walking with assistance.

Case 8.—Mrs. I, aged 78, fractured her femur, and the fracture was plated at once. Two months later she was insisting on walking with a stick, stiffly but unaided.

Case 9.—Mr. J, aged 80, was able to walk short distances in the ward and put on his own clothes. He fell and sustained a Colles fracture of his right wrist. The fracture was not reduced, and, being unable to do anything for himself he became so disgusted with life that he preferred to remain in bed.

Conclusion

The task of rehabilitating old people is never easy, and it is particularly difficult when they have lain neglected in an old "chronic" hospital; but it is most rewarding work. At first the difficulties seem to be insurmountable—the opposition of the diehards, the fears and the conservative attitude of the nurses, the frail physique of the patients, and the unsuitable nature of the traditional "bedridden wards." Only the knowledge of equal difficulties overcome elsewhere, and of the spectacular results achieved, can give the beginner courage to go on. When the first tentative steps are made, progress—if any—is at a snail's pace. The patient is got out of bed for ten minutes and sat in a chair: she slips off in a "wee turn" and has to be hastily tucked in again. Next day she seems stronger, and is more lively and interested: but the examination of her crooked knees gives new cause for despondency. Yet surely the effort is worth while, for at worst she may be taught to get about in a wheel-chair; and at best she can be unbelievably improved by remedial exercises and she can succeed in walking again unaided. The Balkan beam is brought along, bed-end exercises are begun, and a few steps are taken pushing a chair; or else the patient is launched with the help of the walking-machine from which she proceeds to two Warral sticks and then, if we are lucky, to a plain walking-stick with a rubber end. All this work is slow and laborious for patient, nurses, and doctor, and there is little perceptible change each day. But if one looks around the wards a year later—or even sooner—the transformation is startling. The hospital has ceased to be a stronghold of apathy and gloom. The great majority of the patients are out of bed for some part of the day. (In our hospital only 15% of the female patients are now bed-ridden compared with 95% in 1949.)

That sacrosanct pathway of shining linoleum is a busy thoroughfare for shuffling feet. There is Mrs. A, an old woman of 87 and nearly blind, who used to be kept in bed and was very despondent: now she is cheerfully helping a much younger rheumatoid to dress. Here comes Miss B, a long-bedridden disseminated sclerosis, bowling along happily in her wheel-chair, to show the doctor the marvellous tea-cosy she has just completed. And Miss X, that enormous and in every way difficult woman who required four nurses to move her, is pottering round the ward with two Warral sticks, lamenting her six lost years in bed. The old "chronic hospital" has emerged from the doldrums.

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COLINDALE

Hub of the Public Health Laboratory Service

IN opening the new building of the Central Public Health Laboratory at Colindale, London, on Jan. 15, the Minister of Health, Mr. Iain Macleod, traced the origins of the Public Health Laboratory Service, paid tribute to the work it has already done, and expressed his confidence in its future. It has, he said, grown up in a characteristically British way, and a great deal of its success has been due to the happy liaison between the Medical Research Council and the Ministry.

A GROUP OF LABORATORIES

The building itself is a plain but well-proportioned brick structure four storeys high (including the ground floor). It has a copper-covered roof, a central square tower, and a semi-basement, in one or other of which are housed most of the essential services, including, for example, compressors for cold rooms at 4°, —30°, and —70°C, air filters, and a gas-fired incinerator. The building is about 170 feet long and 40 feet wide; it contains some 60 working laboratories. Its design allows great flexibility for making alterations such as removing or constructing partition walls. The basic design of each floor is the same: there is a central corridor running the whole length of the building with rooms leading off on either side. Each floor has a preparation room, sterilising-room, and media-making facilities for its own special needs. There are main and emergency staircases and three lifts—one for passengers and two for services.

The third floor of the new building is occupied by the *Virus Reference Laboratory*. This, under the direction of Dr. F. O. MacCallum, has of late years given increasingly valuable help in the investigation of virus infections both in the laboratory and in the epidemiological field. The new building should remove many of the difficulties and dangers which have hampered virus work in the past. Great care is being taken to prevent contaminating organisms from penetrating into the virus research laboratories and virus-infected air from reaching the outside atmosphere. One of the two service lifts, for example, is intended to travel non-stop between the ground floor close to the virus animal-house and the third floor of the new building. Cold rooms at 4°, —30°, and —70°C are situated on this floor conveniently close to the virus laboratory.

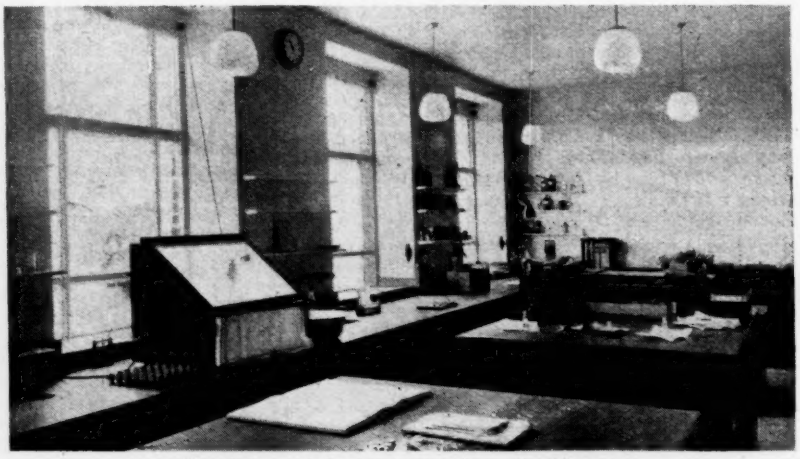
The second floor is devoted to the *Air Hygiene Laboratory* directed by Dr. R. E. O. Williams. The work here will be done in three main sections:

The *streptococcal laboratory* acts as the main reference laboratory for the serological typing of streptococci. This has come to be recognised as an indispensable weapon in the laboratory control of streptococcal infections both in epidemic and in inter-epidemic times. Typing of streptococci is now carried on not only at Colindale but also at some of the regional centres.

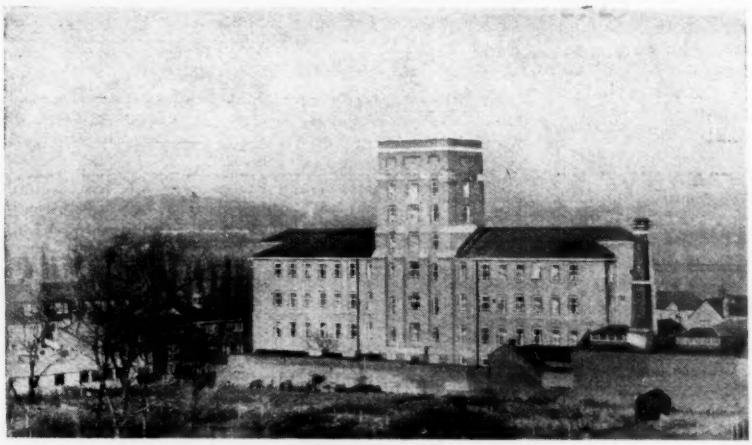
The *staphylococcal laboratory* undertakes the typing of staphylococci from cases and outbreaks of pemphigus, surgical and other cross-infections, and food-poisoning, to mention a few of the common sources. Typing of staphylococci has proved especially valuable recently in tracking down outbreaks of food-poisoning caused by staphylococcal toxins.

The study of *air hygiene* will be greatly helped by the provision of special rooms for investigating problems of ventilation and of air disinfection. Here, under properly controlled conditions, it should be possible to make real progress in solving some of the baffling problems presented by epidemics of respiratory infections.

The first floor is devoted to the bacteriology of food and food-borne infections. The *Salmonella Reference Laboratory*, directed by Dr. Joan Taylor, has built up a world-wide reputation in the identification of organisms of the salmonella and coliform groups and has also investigated the bacteriology of infantile gastro-enteritis. On this floor, too, is the *Food Hygiene Laboratory* directed



Virus Reference Laboratory: part of a routine laboratory.



View of the new building.

by Dr. Betty Hobbs, while Dr. Patricia Carpenter is in charge of the *Dysentery Reference Laboratory*.

The ground floor houses a number of activities. There is a photographic department, some individual research laboratories, and a suite of rooms for Dr. W. Charles Cockburn's *Epidemiological Research Unit*. Much of the work of the Public Health Laboratory Service involves epidemiological surveys, requiring coöperation with the medical officer of health—for example, the successful trials of whooping-cough vaccine recently carried out under the direction of the Medical Research Council.

But the new building, though it is by far the largest single unit of the Central Public Health Laboratory, does not accommodate by any means all of its activities. The work of the laboratory has been severely handicapped in the past by lack of space, and the new building now makes it possible both to rearrange work already being done and to open up new lines of work. The old main building will continue to be the headquarters of the director, Lieut.-Colonel H. J. Bensted. Colindale, in addition to all its other activities, is also a public-health laboratory in its own right and deals with the bacteriology of the surrounding area. The routine laboratory is to remain in this block, together with the *Standards Laboratory for Serological Reagents* under Colonel Bensted's direction. The Standards Laboratory issues diagnostic sera and bacterial suspensions and other biological reagents not only to other public-health laboratories but to hospital laboratories throughout the country.

The old main building still houses the *Central Enteric Reference Laboratory and Bureau* directed by Dr. A. Felix, F.R.S. This is an international as well as a national laboratory, devoted to the study of methods of identifying typhoid bacilli, defining new types or subtypes, and maintaining a register of known typhoid carriers, besides undertaking research on many of the problems raised by the method of bacteriophage typing.

In another building is the *National Collection of Type Cultures* under the direction of Dr. S. T. Cowan. A large collection of reference cultures is maintained here, many of them in the dried state, so as to reduce bacterial variation as far as is possible.

There is another building for the library, suitable also for holding conferences, and others for stores and canteen. There are several separate animal-houses, arranged so as to give the least possible risk of infection and cross-infection.

FUNCTIONS OF THE SERVICE

This in bare summary is an outline of present activities, whose scope will be greatly extended by the completion of the new building. Colindale is quickly becoming one of the main centres in the world in the field of public-health bacteriology and epidemiology. Its reference laboratories are a vital part of the Public Health Laboratory Service, which now possesses, in addition to Colindale, several regional laboratories and 46 area laboratories. From all of these laboratories Colindale receives cultures for precise identification by special methods. The value of these reference laboratories has been proved already in the investigation of numerous outbreaks of different kinds, and many intricate and fascinating epidemics have been unravelled with a speed which would not have been achieved in any other way. It is important to note, too, that this service is not confined to laboratories within the Public Health Laboratory Service. Hospital and other laboratories call upon it for help, and the new accommodation should make possible an increase in this important work.

Though the Public Health Laboratory Service has been described as "about the only section of the National Health Service which receives only *praise and no criticism*," [1] its many-sided activities are still not as widely known as they should be. It has grown in thirteen years from a small compact organisation of some dozen laboratories to its present outstanding position in preventive medicine. From those modest origins there has been a steady expansion which has culminated in the building now completed. The outstanding success of the service has been due at first to the genius of men like the late Prof. W. W. C. Topley, Dr. W. M. Scott, and Dr. F. Griffith, and in more recent years to the farsighted policy and tireless enthusiasm of its director, Dr. G. S. Wilson, and its chairman, Dr. A. Landsborough Thomson. Under their guidance the service has achieved efficient central direction without sacrificing individuality at the periphery. The new building at Colindale is proof of the initiative and courage of those who have managed in these days of frustration and delay to carry it through to completion.

Congratulations are due to all those who have played a part in this project, and to the architects, Messrs. Maxwell Ayrton & Partners, for a building which combines utility with dignity. Colonel Bensted and his colleagues can look forward to enjoying the use of premises worthy of the high standards which their work demands.

FRIENDS OF THE HOSPITALS

THE voluntary tradition in this country, like the small flame of the lighted touch-paper of a firework display, runs ahead sketching an outline which presently will spring into activity and light. The National League of Hospital Friends is not yet four years old but it has already pointed to many ways in which the lot of patients in hospital can be improved.

At the annual general meeting held at St. Bartholomew's Hospital on Jan. 14, Mr. IAIN MACLEOD, the Minister of Health, could hardly have encouraged the work of the league in stronger terms. He recalled the record of a local league formed in 1948 in Aberystwyth, which decided that the first call on its funds should be a former public-assistance institution for the aged and chronic sick. The first and immediate gift of 20 com-

1. Daley, W. A. *Amer. J. publ. Hlth*, 1952, **42**, 1232.

fortable armchairs has been followed since with new curtains, bed-jackets for the women patients, a regular supply of picture papers and other periodicals, a grant for a library, a piano for a convalescent home, a piano-accordion for a blind patient, and wireless installation with headphones in each ward. An annual outing has been arranged for patients who are strong enough to enjoy it, and there are monthly bus rides for others; films are shown in the wards, and visits arranged to the pantomime and to Bertram Mills's circus (the Mills brothers, it seems, are great friends of the hospitals). Services for different denominations are held on Sunday evenings and are broadcast to the wards. This, as the Minister said, is a wonderful record, which can be matched by those of many other local leagues.

But the pattern of social effort is uneven over the country. In many hospitals there are problems which could easily be solved by a league of friends; and he drew attention specially to the plight of the mentally ill, of the chronic sick, and of the young chronic sick, who so often live out their lives among the aged and dying. He would dearly like to see voluntary effort concentrate on these groups; and if it is not yet possible to find a body of friends for every hospital, then let the friends find their way into the old barrack-like hospitals first. He recalled a saying from a King's Fund report—that as people grow older their world grows smaller, and each pleasure and each grievance is correspondingly magnified. Loneliness is the worst misfortune of age, and it is in the hands of the local leagues to allay that. He reminded the meeting that there is a tremendous field waiting in the mental hospitals, for 42% of beds in this country are for the mentally sick, and the waiting-lists are formidable. Occupational and art therapy, he suggested, offer opportunities for helping such patients, since—to quote Cowper—

> "Absence of occupation is not rest,
> A mind quite vacant is a mind distress'd."

Here the league, as he reminded his audience, can call on the experience of Mr. Adrian Hill, the pioneer of art therapy, who is among its vice-presidents.

The Minister was able to reassure the league about a number of matters on which it has been feeling anxiety. Thus, far from regarding it as wrong for the chairmen of hospital management committees to form or initiate local leagues of friends, he is fully in favour of it. It does not matter who forms these groups as long as they are formed. Nor is there any objection to their holding meetings in the hospitals they are befriending; on the contrary the closer the contact between the friends and the hospital the better. Again, there is no reason in the world why the matron and other hospital officers should not come to the meetings, and every good reason why they should. Hospital management committees are appointed by the regional hospital boards, but he saw no reason why the boards should not consult the league when making their appointments, or why the league should not submit names to the boards for consideration. The regional boards themselves, and the boards of governors of hospitals, are appointed by the Minister; but the National Health Service Act requires him to consult various specified bodies (such as the universities) and also those bodies which appear to him to be interested. Mr. Macleod had that day added the name of the National League to the wide range of bodies to be consulted.

The prestige of the league with the Ministry is thus evidently high. It has been further raised by the consent of H.M. Queen Elizabeth the Queen Mother, to become the Patron, as was announced by Mr. J. P. Wetenhall, the chairman, in the course of the meeting. A graceful and appropriate emblem has been designed for the league by Mr. Adrian Hill.

Medicine and the Law

Death Due to Butazolidine

AT an inquest on a 44-year-old woman in Nottingham on Jan. 15, the city coroner recorded a verdict of "death from bronchopneumonia following agranulocytosis caused by butazolidine therapy."

Dr. H. M. Rice, senior pathologist at Nottingham General Hospital, said that during the past year butazolidine had come to the fore as a drug for diminishing or abolishing rheumatic pain. People were undoubtedly benefiting by it; 100,000 patients had been treated in this country alone. Toxic reactions were, however, being reported; and of these the most serious was agranulocytosis. He was of the opinion that the drug should only be administered in hospitals with facilities for daily blood-counts by trained staff.

Dr. Rice said that the medical profession was placed in an extremely difficult position when the general public saw articles in the popular press describing new drugs that were only in the experimental stage. "The public think these drugs are cure-alls and demand them from their doctors, who must warn their patients that the drugs are not free from risk. The patients reply that they have suffered pain for twenty years and are prepared to take a small risk to get rid of the pain. It is a difficult ethical problem."

Public Health

Maternity and Child Welfare in Glasgow

Dr. Stuart Laidlaw, medical officer of health for Glasgow, in his report for 1951 discusses the downward trend in infant mortality.

"Within the past two years," he says, "there has been a tendency for certain writers, particularly politicians, to assume that the marked reduction in infant mortality now implies that the maternity and child welfare work has attained its ends and can now be maintained by a caretaker staff. The truth is that the present reduction is really due to the elimination of the most easily preventable deaths, and the service is now faced with the more difficult task of maintaining the present standards and improving them in many directions. That further improvement is possible is shown by the fact that Glasgow's figures are still nearly double those prevailing in Aberdeen, for example. Of course, our problem of gross overcrowding is unique and is unquestionably a major factor in the relatively high infant mortality rate in the city. Among the many causes of infant deaths in which considerable further reduction could be attained are prematurity, gastro-enteritis, burning accidents, and overlaying. Prematurity is still responsible for more than half the neo-natal deaths, and although the number of deaths from this cause has been reduced the reduction has been achieved at relatively great expense by special provision for the care of the premature child both in hospital and at home. The prevention of prematurity is our aim, and this is closely allied to the ante-natal care of the mother. Infant mortality from this cause can be still further reduced by a standard of maternal care which ensures that the expectant mother receives optimum ante-natal supervision with proper attention to diet and general hygiene. Pre-natal dietary carelessness is still far too common, and education of the expectant mother to avail herself of the facilities provided and to follow the advice given is still vitally necessary.

". . . a closer liaison between the general practitioner and the maternity and child welfare department would benefit both the curative and preventive services. . . . It is disappointing that little advantage is being taken throughout the city by general practitioners of the clinic and other facilities provided for the examination of the blood from expectant mothers. There is no excuse for the deaths (approximately twelve annually) which are due to failure to ascertain the Rhesus factor during the ante-natal period. Yet only half the mothers are tested for Rh."

In England Now

A Running Commentary by Peripatetic Correspondents

IT looks as if the long word has had it. The cult of the short one, started, or at any rate revived, by the Fowler brothers, has had a strong boost in the works of Sir Ernest Gowers, that formidably unprevaricating arch-protagonist of antisesquipedalianism. The jet age has no time for arabesques in language or in art, and the baroque and rococo are gone with the wind.

Away with such useless lumber as adjectives, articles, conjunctions and prepositions! Let's see the naked beauty of the noun, especially the monosyllabic one, articulable in a trice as we and the train we must catch arrive simultaneously at the station bookstall. Let's call our magazine *Life*, *Time*, *Girl*, *Mind*, *Brain*, or *Blood*. Take for instance that old stage-coach the *Proceedings of the Society for Experimental Biology and Medicine*; dare we suggest *Frog* as a breath-saver? And would the *Journal of Pathology and Bacteriology* contemplate *Death* or entertain *Bugs* as an alternative? *Family Doctor* would soon be out of the red with a title such as *Pep*, *Zip*, or *Zest*, and the *Provincial Medical and Surgical Journal* might shed its interim guise of *British Medical Journal* and appear as *Doc*. Our senior clinical journals would take a new lease of life under names like *Ache* or *Pain*, *Cut* or *Slash*, and *Womb* or *Birth*. To the gastro-enterologists we commend *Tripe* or *Guts*, to the physical medicine men *Rub* or *Tap*, and to the rheumatologists *Damp* or *Wet*. The social medicine people may be grateful for *Fog*, and the hospital administrators for *Tape*.

So far as we can see, the only catch about all this is the risk of getting something you don't want, for publishers and detergent makers are running neck and neck. Therefore be sure to buy at a bookshop, otherwise you may get soap for the body or its wrappings and not for the mind. Don't forget there's a world of difference between *Time* and *Tide*.

* * *

Five years ago, before coming to Warwickshire, I was sceptical of the influence of microclimatology upon disease. A bracing climate meant, I thought, a keen prevailing wind, and a relaxing climate a tendency to fogs and a still atmosphere, neither of which I believed could affect more than the psychological health of the residents. I am now sure that I was wrong and that the ill health from catarrhal respiratory illness at all ages is considerably greater along the Avon valley than it is, for example, in London. It is not so much that infections are more frequent, as that they last longer, and are prone to produce complications, such as bronchitis and sinusitis, to which the victims are unused in other places. The explanation is a riddle. Popularly, damp, fogginess, and a "stagnant atmosphere" (whatever that means) are blamed, though the humidity of a river valley does not reach that of seaside areas, and there is more particulate matter in London air than there is here. It is not noticeably colder, nor is there so much overcrowding here as in healthier parts, indeed the reverse, nor are changes in temperature any more extreme or sudden.

So I think that a purely physical effect of climate on people is unlikely. After all, mucous membranes cannot be expected to react in very many different ways; they can be chilled or warmed, caused to secrete more or less, and to become congested or bloodless. There is little subtlety in this and we should look elsewhere for the explanation of a general susceptibility, perhaps to the effect of climate on the growth and virulence of the organisms that cause our repeated catarrhs. A study of bacterial ecology in relation to the soil and climate of different parts of this island could show that a winter differing from elsewhere by only one or two degrees of average temperature, where the soil contained critical traces of certain elements, would provoke luxuriantly malign growth of common pathogens. In other words that the fertile Vale of Evesham is also a bacterial market garden; that not only its fruit and vegetables but equally its micro-organisms flourish exceedingly. And may it not follow from this, knowing the general antagonism between animal and vegetable kingdoms, that for men to be healthy they should seek places where other animals thrive, but that if they choose to live in a vegetable paradise they will become the constant prey of parasitic vegetables?

* * *

"'Ello Luv!" The lady addressing me had attended my outpatient session that morning. The scene of our reunion was the savings bank, where—as a consultant without merit—I do most of my business. As the queue moved slowly up to the counter, I realised more than ever how like the O.P. the bank is. At both, you hand in your book at point A. Your little job needs privacy: you go to point B, a cubicle where you absent-mindedly start to undress. The job done, you are discharged in public at point C. It all takes time—the trajectory described took me a good half hour—and I was attended to by a probationer into the bargain.

Self: "I'd like my interest for the year."
Clerk: "Do you want something out?"
Self: "No! thanks, I just want my interest put in my book. And I'd like some Savings Certificates, please."
Clerk: "What are those?"
Self: "The things the Government keeps asking you to buy."
Clerk: "You'll have to go through that door."
Self: "It's the tenth issue I want; I've got the others."
Clerk: "There isn't a tenth; there's only the ninth."
Self: "The ninth, then. How many can I have?"
Clerk: "Seven hundred."
Self: "The extra ones, I mean. I'll give you a cheque."
Clerk: "Oh no, you have to take it out of what you've got in."
Self: "May I have my book, please?"
Clerk: "You can't have it back here—you have to go through the door to where it says Don't Come on Saturdays."

Discharged at last, I reflected that I had indeed had my interest for the year.

* * *

A friend of ours recently returned from a somewhat trying social weekend spent at a house where they keep a herd of yellow cats for decorative purposes. The doyen of the establishment, a large and cynical tom, had of late taken to looking on the place merely as a sort of second-rate hotel serving indifferent meals. He now lived in the rafters of a disused outhouse, and visited the house at rare intervals, speaking to no-one. It was generally felt that the animal was not pulling its weight, and our friend, stamped as an animal fancier because of his knowledge of the internal economy of the Wistar rat, was deputed to catch the cat and take him to the vet to be destroyed. Physiologists are brave enough in a reckless sort of way, and our friend accepted the commission. Armed only with a cardboard hatbox and his personality, he approached his quarry during its siesta by means of a long ladder. The cat observed the operation dreamily, and such was the lethargy induced by its excesses of the previous night that, after a purely formal protest which caused our friend to fall headlong down four rungs and nearly lost him the sight of one eye, it suffered itself to be placed in the hatbox, secured with string, and settled on the back seat of the car.

By the first traffic lights it had become clear that the cat, though tolerant of hatboxes, thought nothing of cars, and was taking itself to task for allowing itself to be imposed upon. At the second traffic lights our friend looked round in response to a sinister tearing noise and observed a yellow eye regarding him balefully through a jagged hole in the hatbox. Before any steps could be taken, the animal had become fully abreast of the situation and emerged as if propelled by a blasting charge. Our friend tells us that the car became full of cats, thereby causing him to reconsider his views on mammalian parthenogenesis in hatboxes; he counted at least fifteen as they flashed past, upsetting ashtrays, disrupting upholstery, and dismantling armrests. Finally one of the multitude landed squarely on the top of our friend's head and shot out of the driving window, leaving the car empty. By the time he had staunched his shredded scalp and returned home the cat was once more in residence in the outhouse and taking a well-earned nap.

The atmosphere at supper was rather chilly, and our friend's reputation as an animal fancier is now confined to the Wistar rat.

Letters to the Editor

CHILD-WELFARE CLINICS

SIR,—I read with considerable interest the contribution by Dr. George, Dr. Lowe, and Professor McKeown in your issue of Jan. 10. Their account of the work done at clinics, and the reasons for attendance, accords with my own experience, and I agree wholeheartedly with their principles and conclusions. But I cannot endorse their suggestion that an increased capitation fee should be paid for children on the lists of general practitioners prepared to provide a full child-health service from local-authority clinics.

In an urban area such as Birmingham, the children attending any one clinic are patients of several practitioners. If all these doctors elected to provide a full child-health service it would be impossible to organise a clinic session for each of them. On the other hand, if only one or two doctors undertook the service, they would be seeing children at the clinic who were patients of their colleagues and for whom they would not be responsible outside clinic hours—a perpetuation of the present unsatisfactory system.

The analogy with midwifery is clear, and in midwifery we have seen a marked reduction in attendances at antenatal and postnatal clinics. It was never the intention of the National Health Service Act that all general practitioners should practise midwifery and carry out their antenatal examinations in their surgeries; but the incentive to do so has been too great.

Because some practitioners' lists will now have to be reduced to the agreed maximum of 3500, the present is a very suitable time for a general revision. The following scheme would, I believe, solve many problems and have a fair chance of success. Since

(*a*) the supervision and treatment of children can be conducted more satisfactorily from a local-authority clinic or health centre than from a general practitioner's surgery;

(*b*) it would not be practicable to arrange clinics for all general practitioners at which each practitioner could see his own patients; and

(*c*) it is undesirable that a doctor at a clinic should treat children who are on other doctors' lists,

the following proposals are made:

1. All children under 5 years of age should be removed from practitioners' lists.
2. Only those doctors willing to provide a full health service for children, including clinics and domiciliary practice, should be allowed to take children on their lists. The capitation fee would be greater than that paid for other patients, the increase being refunded to the executive councils by the local authorities, which would no longer have to pay the salaries of assistant medical officers.
3. Inclusion of children on a doctor's list would be made at the clinic to ensure that so far as possible the children would be identified with a doctor and a clinic serving the area. There would of course be a free choice of clinics by the mother.
4. The present clinic medical officers would be allowed to take children on to their lists provided they were prepared to provide a full health service including domiciliary care. They are at least as well qualified as their colleagues in general practice to undertake this work.

It will be objected that this scheme is inimical to the concept of the family doctor. In many families, however, the individual members are on different doctors' lists; and this is especially the case with children, the mother stating that she takes her children to Dr. A. because he understands them better than her own Dr. B. Again, not all doctors are keen on work among children, and many would be glad to hand it over to their colleagues. It is significant that, of the mothers questioned at the clinics, "the remainder (almost half) gave reasons suggesting dissatisfaction with their general-practitioner service: the surgery was too far away; a crowded surgery was no place for a child; afternoon consultation was more convenient; or the doctor was abrupt, rude, or too busy to make even a cursory examination." Long waiting periods are another frequent cause of complaint.

I was interested to learn that some general practitioners do their antenatal and postnatal work at local-authority clinics. In my area many practitioners would willingly see their maternity cases at the clinics, but our so far insuperable difficulty has been that the patients attending on any particular clinic day are on the lists of as many as six different doctors. Possibly a solution could be found along the lines outlined above for child-welfare clinics—i.e., that only those practitioners willing to give full antenatal and postnatal care to their patients from local-authority clinics should be allowed to book maternity cases.

If both child-welfare and maternity clinics were being conducted as suggested, it should be reasonably easy to arrange for periodic consultant sessions, obstetric and pædiatric, with all the advantages these would bring. Obviously the integration of these services would have been simplified had health centres been available, but the above scheme would be applicable with existing facilities and could be continued and improved upon in the health centres of the future.

H. TABBUSH
Area Medical Officer.

Oldbury.

MITRAL STENOSIS

SIR,—In your annotation of Jan. 10 about our paper [1] on the dynamics of mitral valvular disease you ask several pertinent questions.

Firstly, the more benign clinical course of patients developing massive left auricles is of great interest. It is probable that the most important single factor in the production of symptoms in mitral disease is pulmonary congestion. A massive left auricle, large enough to double the capacity of the pulmonary venous reservoir, would tend to lead to lower pressures and also to prevent sudden large increases of pressure. Furthermore, these patients generally fibrillate early, and this also tends to lower pulmonary pressures. Tricuspid insufficiency, by diminishing right ventricular efficiency, may well act in the same way.

Secondly, it does not seem surprising that Brock [2] and others should find at operation that the orifices of the stenosed valves are of a fairly uniform size. The in-vitro experiments of Gorlin and Gorlin [3] have shown that, for a given flow, the area of an orifice is inversely related to the square root of the pressure gradient across the orifice multiplied by a constant of 31. If there is no incompetence (and gross incompetence, at any rate, is probably excluded by selection), a small difference in area will lead to a large difference in pressure gradient. Thus, for a given output of 6 litres per minute, an increase in the area of the valve orifice from 1·04 to 1·27 sq. cm. leads to a fall in pressure gradient from 30 to 20 cm. of water. Such a difference in pressure may make a considerable difference to the degree of pulmonary congestion, but it is doubtful if the exploring finger of the surgeon would detect a difference of one or two millimetres on the major or minor axes of an irregular elliptical valve orifice.

It is more difficult to accept Brock's contention that in slight symptom-free cases of mitral stenosis the lumen is an oval of not more than 1·5 by 0·75 cm. Such

1. Wade, G., Werkö, L., Eliasch, H., Gidlund, A., Lagerlöf, H. *Quart. J. Med.* 1952, **21**, 361.
2. Brock, R. C. *Brit. Heart J.* 1952, **14**, 489.
3. Gorlin, R., Gorlin, S. G. *Amer. Heart J.* 1951, **41**, 1.

cases rarely come to operation or necropsy, so opportunities for direct observation are uncommon; but theoretical considerations are much against his view. The area of a roughly elliptical orifice, 1·5 by 0·75 cm., can hardly be greater than 1 sq. cm., and we have seen that to obtain a cardiac output of only 6 litres per minute a pressure gradient across the valve in excess of 30 cm. of water is required. This would necessitate a considerable rise in left-auricular and pulmonary venous and capillary pressures, but catheterisation studies of this type of case, with outputs at this level (or higher), have shown normal pulmonary pressures.[4]

Department of Cardiology, Royal Infirmary, Manchester. GEOFFREY WADE.

BUTAZOLIDINE

SIR,—Œdema is not uncommon during treatment with phenylbutazone (butazolidine), and there is no need to wait for swelling of the ankles or face in order to detect it. If the patient is weighed before and during treatment, it will be found that there is an increase in weight of 2–3 lb. within two or three days, and as much as 6–7 lb. at the end of seven to ten days. When the phenylbutazone is discontinued, the patient passes copious amounts of urine and the weight returns to the original.

I feel that the action of this drug is analgesic rather than specific, because pain recurs fairly frequently if the injections are more than two to three days apart, and it does, in fact, relieve pain in other conditions. For example, I have observed dramatic relief on two to three occasions in severe dysmenorrhœa which had not responded to antispasmodic treatment.

London, W.1. WILLIAM W. FOX.

PINK DISEASE

SIR,—We were interested in Dr. Vulliamy's [5] suggestion that an increase in circulating adrenaline and noradrenaline might be responsible for the vascular disorder in pink disease, because we have ourselves been investigating this possibility following a suggestion made to us by Prof. J. H. Burn in November, 1951.

We have made some preliminary observations on the urinary excretion of noradrenaline in normal children and in children with pink disease; and one of us (G. P. B.) has also made studies on adults with proven phæochromocytoma. In each case a 24-hour collection of urine was obtained. Noradrenaline was adsorbed on aluminium hydroxide, and subsequently assayed by intravenous injection into a cat.[6]

The urinary excretion of noradrenaline in 9 convalescent children, whose ages ranged from 3 months to 10 years, lay between 10 μg. and 27 μg. per 24 hours. In 24 hours the child aged 3 months excreted 18 μg.; and 2 children aged 20 months and 2 years excreted 12 μg. and 14 μg. 3 adults with proven phæochromocytoma excreted 180 μg., 300 μg., and 3700 μg.

So far we have made estimations on only 2 children with Pink disease. Both were classical and fully established examples of the syndrome, showing prominent neurovascular signs—that is to say, hypertension, tachycardia, sweating, and cold pink puffy hands and feet. One affected child excreted 16 μg., and the other 21 μg., noradrenaline in 24 hours. These figures lie well within the normal range, and contrast sharply with the levels we have found in urines from adults with phæochromocytoma. The excretion of noradrenaline fluctuates widely from day to day, and therefore a small average change in excretion would be difficult to detect.

The scanty figures that we have so far obtained do not support the suggestion that noradrenaline output is greatly increased in pink disease. This does not in any way invalidate the use of 'Priscol' in treatment. Further work is in progress.

Departments of Pædiatrics and Biochemistry, Radcliffe Infirmary, Oxford. GEORGE P. BURN
CHRISTOPHER OUNSTED
VICTORIA SMALLPEICE.

4. Wade, G. M.D. thesis, University of Manchester, 1952.
5. Vulliamy, D. G. *Lancet*, 1952, ii, 1248.
6. Von Euler, V. S., Hellner, S. *Acta. physiol. scand.* 1951, **22**, 161.

CHRONIC OTITIS MEDIA

SIR.—Mr. Layton (Jan. 10) seeks to revive the old idea that the acellular mastoid process is due to sclerotic obliteration of the air cells in a once "normal" pneumatised process. The cases he cites do not support this view: they show merely that inflammation may inhibit further pneumatisation. X-ray examination of the mastoid was practised long before twenty-four years ago when "the first mastoid X-ray picture was taken at the North Eastern Hospital," and since then has been a common procedure. Where is the evidence that a normally pneumatised mastoid (say in a child of 5) ever becomes an acellular or so-called "sclerotic" process? Since hundreds of patients have been radiographed without such a finding we must reject the theory.

Bristol. E. WATSON-WILLIAMS.

LIGATION OF THE POPLITEAL VEIN

SIR.—Mr. Goligher (Jan. 10) states that the facts recorded in my paper (Jan. 3) do not warrant the conclusion that popliteal ligation is of any value. To refute this conclusion he considers one group only of the recorded cases (those with ulcers) and fails to remark that all of the second group (7 legs), where the patients complained of aching, swelling, &c., of the legs, were relieved of their symptoms.

To return to the group he does consider, he simply states that 7 of the 11 patients showed no sign of recurrence and takes no note of the fact, clearly shown in the paper, that of the cases which failed (5 of 13 legs) 3 should not have been operated upon (in 1 the femoral and popliteal veins were occluded, in 2 there was an arterial deficiency) and were a failure of judgment, not of method; 1 patient refused to wait for a graft but was relieved of her pain and swelling; and 1 ulcer broke down after 2 years. Therefore of the 10 cases which were suitable 8 were successful, 1 partially so despite incomplete treatment, and 1 failed.

Mr. Goligher also "considers that the results are not very different from what might be obtained after bed rest and grafting alone." This, of course, may be so, but such a statement would bear more weight if backed by figures; and it is of interest to note that of 5 cases treated by grafting alone in the Massachusetts General Hospital [1] none remained healed, while of 13 treated by excision of the ulcer and grafting 10 broke down.

The second half of Mr. Goligher's letter concerns the results of superficial femoral vein ligation. He states that "the principle of this operation and that of ligation of the popliteal vein are the same, and the results should presumably be also similar." It might as well be said that because the principle of ligation of the superficial femoral artery and of the popliteal artery are the same, the results should also be similar. Bauer [2] has given the reasons for ligation of the popliteal vein in preference to the superficial femoral; and it is worth noting that Linton [3] has given up ligation of the superficial femoral vein, although he was one of its chief advocates,[1] because of a 30% rate of failure—the same percentage failure as that of Glasser.[4]

I would suggest, then, that Mr. Goligher's failures after superficial femoral vein ligation should not lead him to condemn out of hand ligation of the popliteal vein.

General Infirmary, Leeds. H. D. MOORE.

1. Linton, R. R., Hardy, I. B. *Surgery*, 1948, **24**, 452.
2. Bauer, G. *J. int. Chir.* 1948, **8**, 937.
3. Linton, R. R. *Angiologia*, 1952, **3**, 439.
4. Glasser, S. T. *Surg. Gynec. Obstet.* 1948, **89**, 541.

TERRAMYCIN IN SALMONELLA INFECTIONS

SIR,—I feel that Dr. Watson's letter (Jan. 3) may give rise to undue optimism regarding the value of terramycin in these infections.

Recently, I treated a *Salmonella typhi-murium* carrier, aged 5 years, with this drug. The dose used was 400 mg. thrice daily to a total of 5 g.—i.e., approximately 4 days' treatment. This dosage in a boy weighing 46 lb. is comparable to the dosages cited by Dr. Watson and was the maximum amount I could obtain from the South London Blood Transfusion Depot for the treatment of a boy of that age. The organism was absent from the stools 6 days after completion of treatment, but 2 days later it was again present. His stools have since remained persistently positive.

Similar temporary reversion in the carrier state may be obtained by use of chloramphenicol.

One of my patients—a carrier of *S. enteritidis*—did become permanently negative after a course of terramycin. The evidence of the beneficial effect of terramycin was in this case vitiated by the fact that immediately before treatment the number of organisms decreased spontaneously. There is a risk of giving too much credit to drugs exhibited when natural recovery from the carrier state is taking place.

Waddon Hospital, Croydon. J. J. LINEHAN.

SIR,—Recent correspondence on the value of terramycin in salmonella infections prompts me to record the following case.

A male child, aged twenty months, was admitted to hospital with enteritis due to *S. paratyphi B*. He was treated with chloramphenicol ('Chloromycetin Palmitate,' 4 fluid drachms, followed by 2 fluid drachms six-hourly for eight days, and 1 fluid drachm six-hourly for a further six days). Though he improved clinically, he continued to excrete the organism in his fæces. He was then given a combination of sulphathiazole and penicillin, and later streptomycin by mouth, but without effect.

The organism was shown to be sensitive to terramycin, though unfortunately a quantitative result was not given.

Three months after admission, the child was given terramycin 400 mg., followed by 200 mg. four-hourly for eight days. Four successive rectal swabs were then negative for *S. paratyphi B*.

During a recent epidemic of paratyphoid B in this area, it was found that though there was a fairly rapid clinical improvement in cases treated with chloramphenicol, many of these patients continued to pass organisms in their stools, often for two or three months and even after a second course of the antibiotic. Terramycin may be of value in these cases.

Llwynypia Hospital, Rhondda. M. S. PATHY.

MARASMUS TODAY

SIR,—May I thank you for your exposition (Jan. 10) of renal acidosis and idiopathic hypercalcæmia as causes of marasmus, and may I ask that in the differential diagnosis the effect on infants of the absence of maternal care be included.

Chapin [1] prevented deaths from marasmus by placing infants in foster-homes instead of institutions; that wise pædiatrician, Brennermann,[2] had a rule that babies in his hospital were to be picked up and carried around several times a day; Bakwin [3] showed how infants in hospital showing successive infections and progressive loss of weight became afebrile and gained weight from the day they returned home to their mothers; in this country Sir James Spence and Prof. Alan Moncrieff have for many years taught the importance of humane care of babies in hospital.

I would like to think that failure to thrive from this cause does not exist today in this country; but it does, for I see the results at times, so that it is worth while naming "loneliness in infancy" as a cause of marasmus in infancy.

Guy's Hospital, London, S.E.1. RONALD MAC KEITH.

1. Chapin, H. B. *Trans. Amer. pediat. Soc.* 1915, **27**, 180.
2. Brennermann, J. *Amer. J. Dis. Child.* 1932, **43**, 577.
3. Bakwin, H. *Ibid*, 1942, **63**, 33; *J. Pediat.* 1949, **35**, 512.

THE ANKLE BLOW-OUT SYNDROME

SIR,—I would like to cross swords with Mr. Cockett and Mr. Elgan Jones over their conclusions (Jan. 3) concerning the ætiology of leg ulcers.

Their careful observations agree substantially with those of most workers except at one point. They state that incompetence of the valves is strictly localised to the lower perforating veins, and that the remaining valves in the deep veins are healthy (figs. 6 and 7). I would not quarrel with their findings on dissection, but the anatomical presence in the cadaver of an apparently healthy valve may not correspond to a functioning valve in the living patient. Large series of phlebograms in fact indicate that the deep veins do often present extensive valvular incompetence, nor do the radiographs published by Mr. Cockett and Mr. Elgan Jones exclude this possibility in their own patients.

On general pathological grounds, one might expect valvular incompetence to be extensive rather than strictly localised to the lower perforating veins, since recanalisation after thrombosis is so often the cause. Nevertheless, in certain cases there is no theoretical reason why it should not be so. What, then, is the accompanying pathology? Mr. Cockett and Mr. Elgan Jones state that infection constantly occurs with each of the four groups of factors leading to ulceration, with local thrombosis rapidly supervening. The superficial part of a perforating vein in the base of an ulcer can hardly escape the thombosis—operation amply confirms this assertion. The deep part of the communicating vein certainly remains patent as a blind diverticulum of the deep vein; but a superficial block is no less effective for being so, since all the cutaneous tributaries are likewise involved. Such a block, being in effect akin to the local ligature operation proposed by Mr. Cockett and Mr. Elgan Jones, might be expected to cure the ulcer if there were no valvular incompetence elsewhere. That self-cure does not occur in this way suggests that we are arguing from a false hypothesis, and that, contrary to the authors' assertion, there must be valvular incompetence elsewhere.

Like any other form of reciprocating pump, the muscular venous pump in the leg is only effective in the presence of adequate valves. It is further not just one but a series of pumps in line from below upwards, each consisting of a segment of vein with an inlet valve at its lower end and an outlet valve at its upper end. The diastolic pressure at the lower end of each is limited to the height of the column of blood contained in each segment—i.e., a few inches of water. The systolic pressure is a function of the muscular force applied laterally to the walls and the resistance above the outlet valve. Mr. Cockett and Mr. Elgan Jones cite a figure of 100 mm. Hg, but it must be noted that a raised systolic pressure will only be recorded in the upper two-thirds of the leg, where the muscle bellies provide the necessary force. Only if the deep veins show incompetence of their valves in this portion of the leg can a raised systolic pressure be transmitted to the lowest third of the leg.

Now Mr. Cockett and Mr. Elgan Jones emphasise that incompetence is only found in the lower perforating veins, and that these "are situated just *below* a powerful muscle pump." They specifically draw attention to the fact that in their dissections valves are always "present in veins of posterior tibial bundle" (fig. 7). In these circumstances systole cannot affect the pressure in the veins *below* the pump, whatever the state of the valves there. Similarly, the diastolic pressure in the lowest third of the leg transmitted through a perforating vein cannot show a rise due to an incompetent valve greater than the difference in levels between that valve and the next functioning valve above—i.e., no more than an inch or so if the authors' contentions are correct. That in fact both systolic and diastolic venous pressures are considerably raised in leg ulcers suggests that the valvular incompetence is far more extensive than is admitted in their paper, involving the deep veins in the upper two-thirds of the leg and higher.

An operation or any line of treatment which ignores this more extensive incompetence is not likely to be uniformly successful in healing leg ulcers. Mr. Cockett and Mr. Elgan Jones agree that their follow-up is short, allowing of no definite conclusions about the efficiency of their operation, and I venture to suggest that its basic premise is untenable.

The constant finding in phlebograms of ulcerated legs, of a long column of unsupported blood in the deep veins due to an almost total absence of valves, led Bauer and others to investigate the effect of ligature of the popliteal or superficial vein. But as Mr. Goligher has pointed out (Jan. 10), the results of this operation are equivocal. This is not surprising since the column of blood is not a static phenomenon, and a leaking valve will hardly be improved if a complete block is placed across it. The deep veins are the main channels along which blood returns to the heart from the lower limbs, and the swelling which follows the operation is ample witness to the further rise in venous pressure caused by it. Rest and bandaging are even more constantly required than ever.

It seems an inescapable conclusion that a reduction in venous pressure (and hence healing of the ulcer) can only be brought about by restoration of the valvular action in the muscle pump. (In animals an attempt has been made to insert acrylic-resin valves, or grafts of a healthy vein with valve.) Such a restoration can be effected by the simple manœuvre of firm bandaging from toes to knee. Its very simplicity is regarded as suspect by a few, but it does in fact appear to provide a form of valvular action within the deep veins. Originally and consistently advocated by Mr. Dickson Wright,[1] it is by far the most successful form of treatment yet devised, even in the presence of enormous ulcers. It probably acts in this way:

The successive turns of the bandage apply a slightly varying pressure along the leg. Although the surgeon tries to put the bandage on evenly, he never can achieve theoretical equality of pressure throughout, as the faint ridges on the skin indicate when the bandage is removed. This "even" pressure reduces the average calibre of the vein and the slight variations occlude the deep vein at intervals along its length, the average pressure applied being very little greater than the diastolic pressure in that vein. In systole the muscle pump forces blood both up and down the limb through the occluded segments, but mainly upwards, as the resistance is greater distally. In diastole once more, the various points of occlusion due to the turns of bandaging prevent regurgitation downwards of the blood forced upwards during systole.

This valvular action is imperfect but hydrostatically most effective. The muscle pump has been repaired and venous pressure falls. Inevitably the ulcer heals.

Hampstead General Hospital, N.W.3. GERARD KRAFFT.

SIR,—I should like to join in congratulating Mr. Cockett and Mr. Elgan Jones on their work on the "ankle blow-out syndrome," which is clearly of fundamental importance both in the ætiology and treatment of certain leg ulcers.

The following quotation from John Hilton[2] seems an interesting prelude to the careful anatomical investigations of Cockett and Elgan Jones:

"Why is it that varicose ulcers occur so frequently at the inner and lower part of the leg? It might be said that they occur because the blood in the veins of the lower extremities has to run up-hill, and gravitation interferes very much with the return of the blood; the valves get broken down, and the whole pressure is retrograde, if we may so term it, and so these ulcers arise. If that were the sole reason, ulcers should occur by preference on the feet or on the toes, because these are more remote from the general circulation than the ordinary site of ulcers from varicose veins. Hence, I suspect that this cannot be the explanation. The explanation has always—at least for some time past—appeared to me to be this: The superficial and deep veins of the leg freely communicate with each other in the neighbourhood of the ankle-joint. The first two inches above that point is the spot where the greatest stress is laid upon these superficial veins; below that point they freely communicate, and if the blood cannot return by the superficial veins, it can do so by the deep veins, or vice versa; but when you reach the point above the inner malleolus (where that brown patch of skin so often occurs in old persons) it is otherwise, and that appears to me to be the reason why ulcers from varicose veins occur so frequently about that neighbourhood."

Leeds. S. T. ANNING.

1. Wright, A. D. *Lancet*, 1931, i, 457.
2. Hilton, J. *Ibid*, 1861, ii, 245.

COLORIMETRIC ESTIMATION OF POLYVINYLPYRROLIDONE BY IODINE

SIR,—Recent experimental work has enabled us to increase the sensitivity of the colorimetric method for estimating polyvinylpyrrolidone (P.V.P.) described by Thrower and Campbell.[1] The reaction has now been shown to involve free iodine and not the I_3^- ion as previously stated, and consequently, with solutions of iodine in aqueous potassium iodide, the intensity of colour developed depends on the concentration of free iodine, which is governed by the equilibrium

$$I_2 + I^- \rightleftharpoons I_3^-.$$

It is not possible to increase the sensitivity by the use of alcoholic solutions of iodine, in which all the iodine is present in an un-ionised form, since ethyl alcohol interferes with the colour reaction. The behaviour of this coloured complex between iodine and P.V.P. is very similar to that with starch. Thus the colour of the complex is completely discharged by sodium thiosulphate, sodium arsenite, or a strong base. On warming, the colour of the complex disappears but it reappears on cooling.

The observations described here were made at 500 mμ with a Unicam SP 500 spectrophotometer and cells of optical path length 1 cm., but similar results have been obtained with an Eel colorimeter (Ilford 603 filter). The optical densities are measured against an aqueous solution of identical iodine and potassium-iodide concentrations without any P.V.P. All concentrations referred to below are the actual concentrations in the solution being measured.

At constant potassium iodide and iodine concentrations the relationship between optical density and P.V.P. concentration is not a straight line but may approximate to this over a useful range of P.V.P. concentrations at low potassium-iodide and high iodine concentrations. Typical sensitivities in these straight line regions are given in the accompanying table (I, II, III). In addition the maximum sensitivity obtained under conditions similar to those described by Thrower and Campbell [1] are given (IV).

VARIATION OF SENSITIVITY WITH COMPOSITION OF REAGENT

—	Iodine conc. normality	Potassium iodide conc. normality	Sensitivity P.V.P. conc. (mg. per ml.) to give an optical density of 0·05	Useful range of P.V.P. conc. (mg. per ml.)	—
I	$5·0 \times 10^{-4}$	$1·0 \times 10^{-2}$	0·005	0–0·02	Poor straight line
II	$1·0 \times 10^{-2}$	$2·0 \times 10^{-2}$	0·0035	0–0·04*	Good straight line
III	$5·0 \times 10^{-2}$	$25·0 \times 10^{-2}$	0·0022	0–0·03*	Good straight line
IV	$1·0 \times 10^{-2}$	150×10^{-2}	0·0175	0–0·425*	No straight line

* The useful range is limited by the inaccuracy of measurement above an optical density of about 0·7.

A further increase in sensitivity by increasing the iodine concentration is impracticable since the blank absorbs too much light. It is found that, with the most sensitive conditions, a considerable time (1–2 hours) is required for the maximum colour to develop, so that it is convenient to sacrifice some sensitivity for greater speed.

These results have suggested the following method, which is about five times more sensitive than that pre-

1. Thrower, W. R., Campbell, H. *Lancet*, 1951, i, 1096.

viously described by Thrower and Campbell: to 10 ml. of the P.V.P. solution, 0·1 ml. of a 0·1 *N* iodine solution in 0·1 *N* potassium iodide is added, and the optical density is measured after 10–15 minutes. The concentration of P.V.P. present is found by using experimentally determined calibration curves.

The urine, plasma, or serum must be pretreated, as previously described, before the above measurements are made. An alternative method of removing proteins by acetic acid [2] has been found satisfactory.

A fuller account of this method will be published later.

Research Laboratories,
May & Baker Ltd., Dagenham, Essex. H. CAMPBELL.
Electro-medical Research Unit,
Stoke Mandeville Hospital,
Aylesbury, Bucks. G. HUNTER.

SUPPORTIVE THERAPY

SIR,—I was interested in the Manchester article of Jan. 10 describing an improved type of dextran. Will someone please tell me why this material is dissolved in physiological saline solution? Has 6% dextran no osmotic pressure at all? I feel that it is almost impertinent to remind you, Sir, that the normal serum-chloride level is equivalent to a 0·58% solution of sodium chloride, and that physiological saline contains (usually) 0·9% of sodium chloride, a somewhat unphysiological excess of chloride.

Pathological Department,
Whipps Cross Hospital,
London, E.11. W. W. WALTHER.

BOVINE TUBERCULOSIS AND HUMAN TUBERCULOSIS

SIR,—In reply to Mr. Daw (Dec. 27) I should like to say that population variations were taken into account in every county mentioned in the figures given in my letter (Dec. 6). The increase or decrease in the number of notifications is per 100,000 population. Mr. Daw states that "something more than an apparent statistical relationship is required before any such hypothesis can be accepted." In my view, when 10 out of the 11 Scottish counties, with more than 50% of cattle attested, show an increase in human pulmonary tuberculosis, and when 10 out of 11 Scottish counties, with less than 16·5% of cattle attested, show a reduction, the one result is the consequence of the one cause.

I gave the figures for the 11 Scottish counties with the highest and lowest proportions of attested cattle. The 10 counties with proportions between those of these two groups would show no significant alteration.

Mr. Daw also says "I find Mr. Pitcher's argument unconvincing." It has long been assumed that bovine tuberculosis increases human tuberculosis. What I have tried to show is that the elimination of bovine tuberculosis does not decrease human infection, but very substantially increases it.

Turning to the points raised by Dr. Bradshaw (Jan. 10), I applied in every case to the county medical officer of health for notifications of pulmonary and non-pulmonary tuberculosis for the years 1920 (before tuberculin testing of cattle) to 1950 (when the attested-cattle scheme had been in existence for fourteen years, although tuberculin testing of cattle was being practised to a fairly wide extent before 1936, especially in Scotland). I simply took the average for the first five years and compared it with the average for the last five years, taking into account the number of people notified as having pulmonary tuberculosis. In some cases, where figures for the full period were not obtained, the earliest five years were contrasted with the latest five years.

The significant feature in Scotland is that until about 1936 all the Scottish counties were showing a reduction in tuberculosis notifications, and this reduction has continued in the counties with relatively few attested cattle, whereas the reverse is taking place in counties with 50% or more of attested cattle.

Dr. Bradshaw's suggestion that the final figure for West Lothian should be +119 and Dumbarton +12 is correct, but this alteration merely emphasises my point.

In the matter of Glasgow, Dr. Bradshaw points out my error, and I must confess to having confused the Burgh of Glasgow with the Port of Glasgow, Renfrew. The final figures of notifications of pulmonary tuberculosis for the Burgh of Glasgow per 100,000 population should be: 1930–34, 150; 1946–50, 248. There has been relatively little alteration in the population; and the corrected figures further endorse my point.

Dr. Bradshaw remarks "there is a fundamental defect in the logic of Mr. Pitcher's argument" in not considering whether *living* tubercle bacilli are ingested. My belief is that the milk of a dairy cow infected with tuberculosis (tuberculosis of the udder and hence infection of the milk is an extremely rare condition) contains a substance which I have called "tuberculin" which, when ingested by human beings, increases their resistance to the human bacillus. I am not prepared to say whether this substance is a secretion or excretion or both of the bovine bacillus, but its existence is supported by my figures. I do not believe that pasteurisation would have any effect on the antibody value of this "tuberculin."

High Wycombe. L. PITCHER.

INTRATHECAL PENICILLIN

SIR,—I have read with interest Dr. Haynes's letter last week concerning the death of his patient with Waterhouse-Friderichsen syndrome, following the intrathecal injection of penicillin, and also the letter from Dr. Aronson and his colleagues (Dec. 20) concerning the danger of intrathecal penicillin to which phenol has been added. Other cases have lately been described.[1]

It is with regret that I record the death, some three years ago, of two patients with pyogenic meningitis following the intrathecal injection of 20,000 units of crystalline penicillin to which no preservative had been added. A few hours after the injection, as in Dr. Haynes's case, convulsions were followed by death.

Since then I have not used penicillin intrathecally. Perhaps those with greater experience can tell us the frequency of this complication. I saw no mention of it in the report of the recent discussion on the treatment of non-tuberculous meningitis held at the Royal Society of Medicine.

Maidstone, Kent. RONALD LASS.

CONGENITAL ANOMALIES OF THE BONY THORAX AND LUNGS

SIR,—I have examined miniature fluorographs of 18,570 soldiers, aged 22–28, and I have found the following abnormalities of the bony thorax:

(1) Supernumerary cervical ribs	..	31 (*0·17%*)
Bilateral	..	7 (*0·04%*)
Unilateral (rt.-sided 18, lt.-sided 6)		24 (*0·13%*)
(2) Synostosis of ribs	..	14 (*0·07%*)
Between the 1st and 2nd ribs	..	12
Between the 1st, 2nd, and 3rd ribs		1
Between the 8th and 9th ribs	..	1
(3) Rudimentary 1st thoracic ribs	..	3 (*0·02%*)

There were thus 48 (0·26%) rib anomalies in all.

These figures, although they refer to young men only, agree quite well with those previously published.

None of the 31 men with cervical ribs had any symptoms attributable to the condition, though they were all accustomed to strenuous exercise. In 12 cases the radial pulse disappeared when the hand was raised above the head and bent towards the opposite side.

Steiner [2] found 6 cases of tuberculosis among 59 people who had anomalies of the ribs; but in only 1 of my cases was there

2. Hunter, G. *Canad. J. Res.* 1949, **E27**, 230.

1. Edmunds, V., Porter, R. J. *Brit. med. J.* 1952, **ii**, 668; Going, C. H. *Ibid*, p. 777.
2. Steiner, H. *Radiology*, 1943, **40**, 175.

any evidence of pulmonary tuberculosis, and the disease was not extensive. Another soldier with a rudimentary 1st thoracic rib also had pulmonary tuberculosis.

Hadley (quoted by Purves and Wedin [3]) mentioned an association between unilateral cervical rib and scoliosis, but I did not find an example in my series.

In one case of synostosis there was a minimal tuberculous lesion in the lung, and in another a big echinococcus cyst of the corresponding lung; both these findings were clearly coincidental.

There were also 24 (0·13%) azygos-vein lobes in this group, but the true figure is no doubt considerably higher, for an azygos lobe may be invisible on the miniature film. No association was noted between this anomaly and costo-vertebral malformations, though Jalet [4] described 6 cases. None of the 24 soldiers had tuberculosis of the azygos lobe or fissure.

Athens. C. P. STAVROPOULOS.

THE MEDICAL SERVICES IN THE KOREAN WAR

SIR,—Your article last week on this subject will, in general, have given satisfaction to all interested in war surgery.

It was, however, disturbing to note that, while the U.S. Forces had ample supplies of fresh blood for transfusion, the Commonwealth Forces were relying mainly on plasma. It was the opinion of almost all who worked in the forward areas in the Western Desert, Sicily, Italy, and North-west Europe that in the treatment of battle casualties plasma was good but whole blood was very much better. It is stated that the terrain in Korea is similar to that of Tunisia. At the battles of Mareth and Enfidaville the number of bottles of blood used per 100 casualties outnumbered that of plasma by more than two to one.[5]

The difficulties of supply of blood in forward areas are considerable; but it is not easy to understand why what was thought desirable, and moreover possible, in 1943 does not hold good today.

Hove. REX BINNING.

MORE FOOD

SIR,—"Your 1947 Correspondent" when he says "I told you so" (Dec. 13, 1952) is, of course, right in pressing for more home food production. But surely he is wrong in his cognate arguments? Firstly we cannot forgo any part of our exports: on the contrary we need more exports to pay for our raw materials, our consumer goods, and our armaments. We need more exports and more home-produced foods. Secondly there can be no panacea simply by allowing the "scale of rewards to the farmer to go on swinging up and up."

Many factors are involved in increased food production—improved farming skill, dissemination of scientific knowledge, improved soil fertility, increased scientific knowledge, attraction of skilled farmers back to the hill farms, and cultivation of unused acres. All these cannot be achieved simply by higher rewards. Industry has shown that monetary reward alone is not a sufficient incentive for human endeavour, and it is difficult to imagine any reward that would attract a farmer to work marginal land when he can till fertile land instead. The capital outlay needed to convert marginal land into productive farms requires large-scale investment: only with the aid of something in the nature of a Home Development Corporation could any private individual contemplate taking over.

It is a fact that many farmers could fairly easily improve their output and so their profits by the application of scientific methods already practised by the more efficient farmers, yet they will not. Extra profit is not effective in their case. Similarly, money alone will not attract farmers to the hills; they require the amenities of a civilised life as well.

On the other hand, I agree with your correspondent that farmers should be treated as a special and even privileged class. It is true that many people and political parties are not willing to allow anybody more than a "fair" reward; but would anyone grudge the coal-miner special rewards for doing a difficult and dangerous job that is so essential yet no-one else will do? Under conditions of national emergency we willingly treat our special categories on a privileged basis; and, in regard to food, we are in a world emergency.

We are moving into a period when the world food shortage will soon begin to affect us. At present two-thirds of the world are starving, including countries which export food to us. What will happen when the countries not only eat the food that they now export but even compete with us in the world market for available food?

There is no single solution to this problem. We must develop the underfed countries to help them to feed themselves; we must develop the unused territories; and we must grow more food at home. There is no single method of increasing food production at home; every practical proposal must be followed up—whether it is utilisation of leaf protein, fertilisation of the sea, development of marginal lands, increasing soil fertility, or really collecting all waste food to feed pigs and poultry.

There is an aspect of food prices of special interest to medical men and nutritionists. How can we persuade people to drink more milk and eat more eggs if the prices are high? They prefer to spend their money on films and cigarettes. Are subsidies, or is education, the answer? Or something else? I do not know; but at least I have indicated that your correspondent's panacea of more profit simply cannot work.

London, W.13. A. E. BENDER.

PARONYCHIA

SIR,—Mr. Lowden, whose paper you published last week, seems to have obtained some very good results in this infection, by combining systemic penicillin with locally applied chloramphenicol. This is interesting in view of the reported antagonism between these two antibiotics.[1] The series treated by Mr. Lowden with penicillin alone seems somewhat small for comparison, and no details of dosage are given. It would be interesting to know whether the bacteria isolated in this series were sensitive to penicillin and chloramphenicol together.

On theoretical grounds it might be more desirable to use a local application containing penicillin and streptomycin (of which there is a convenient proprietary preparation), as these two antibiotics are synergistic. It is unlikely that streptomycin resistance would be evoked during the short time of treatment; and the preparation is probably cheaper than the equivalent chloramphenicol one.

In general practice over the past five years I have not encountered any case of paronychia which did not respond to systemic penicillin alone, administered by methods described elsewhere.[2,3] However, my cases are nearly all early ones, as compared with the more extensive cases described by Mr. Lowden in hospital practice. It is probable that many more cases are successfully treated in general practice than reach the hospital casualty department. It might be instructive to hear something of the results obtained by general practitioners in this and allied pyogenic conditions, with regard especially to the periods of disability.

Twickenham. DAVID WHEATLEY.

3. Purves, R. K., Wedin, P. H. *J. thorac. Surg.* 1950, **19**, 952.
4. Jalet, J. *Bull. Soc. Radiol. méd. Paris*, 1937, **25**, 141.
5. Barlow, K. G. A. *In* Inter-Allied Conferences on War Medicine. London, 1947; p. 189.

1. Armstrong, C. W. J., Larner, A. E. *J. Lab. clin. Med.* 1951, **37**, 548.
2. Wheatley, D. P. *Brit. med. J.* 1947, i, 530.
3. Wheatley, D. P. *Practitioner*, 1949, **162**, 508.

Obituary

FRANK KEITH HAYMAN

M.B. Lond., F.R.C.S.

Dr. Hayman, who died on Jan. 9 at his home at Sharnbrook, Bedfordshire, at the age of 59, had spent most of his medical working life at Yarmouth, and he was consulting surgeon to the Great Yarmouth General Hospital.

His father and grandfather had both practised dentistry in Bristol, and he was educated at Clifton School and Bristol University. He took his M.B. Lond. in 1916 and then served abroad with the R.A.M.C. On his return he took the F.R.C.S. in 1920, and the following year he settled in Great Yarmouth as a partner in an old-established practice. Within five years he was appointed assistant surgeon to the Great Yarmouth General Hospital and he became full surgeon in 1927.

L. L., a colleague at Yarmouth, writes: "Keith Hayman was always cheerful and unassuming, and perhaps his chief characteristic was his equanimity, which in the war rose superior to several bombing attacks in his neighbourhood, and one very large bomb which exploded within a few yards of his house. His holidays were spent in a motor-drawn caravan, which he had built himself, for the hands of the surgeon could be adapted at will to another skilled craft."

In 1945 ill health forced Hayman into at any rate semi-retirement. After he left Yarmouth he held a Ministry of Pensions appointment until his love of clinical work led him to return to general practice in Bedfordshire.

A. W. A., a friend from schooldays onwards, writes: "Keith was notably gifted with his gadgets and always making or acquiring or inventing. In sports he excelled at swimming and diving; in the arts he was a keen exponent of the piano. Always he was a man of deed not word, and what he wanted he usually effected. His independent enterprising character led him to start practice on the East Coast, and medicine there gained, what Bristol has missed, a doctor who sought the precise truth in diagnosis and hated humbug and self-deception. He tended his patient with a gentle, kindly, human skill. His self-effacing nature accorded with his slight regard for ceremony and convention, and was combined with reliability and an intrepid spirit."

Births, Marriages, and Deaths

BIRTHS

EDDY.—On Jan. 12, to Margaret Joan, wife of Dr. Angwin Eddy, of Aldborough, Norwich—a son.

EVILL.—On Jan. 10, to Judith, wife of Dr. Christopher Evill, of Willow Lodge, Kempsey, New South Wales—a son.

HORSFALL.—On Dec. 13, in Cairns, Queensland, to Mary (née Sidgwick), wife of Dr. W. R. Horsfall—a daughter.

LEWIS.—On Jan. 11, at Oxford, to Evelyn, wife of Dr. Charles Lewis—a daughter.

WATKINS.—On Jan. 14, at St. Luke's Hospital, Guildford, to Alison (née Carington), wife of Dr. P. F. A. Watkins, of Hazel Cottage, Peaslake—a daughter.

MARRIAGES

HOPWOOD—ERB.—On Jan. 14, at Raghunathpur, Bihar, India, Gerald Maxwell Hopwood, M.R.C.S., of Whetstone, London, to Margaret Erb, of Ontario, Canada.

LEWIS—BATTEN.—On Jan. 17, at Fulham Cross, Edward Claude Lewis, M.B., to Rosemary Batten.

DEATHS

BROWNE.—On Jan. 13, at the Bristol Royal Infirmary, Frederick William Browne, M.A., B.M. Oxfd, of Shirehampton, Bristol.

COOPER.—On Jan. 15, at Packhorse Cottage, Bessels Green, Sevenoaks, John Gerald Cooper, M.B. Camb., aged 78.

ELSNER.—On Jan. 12, at Heighington, Darlington, Colonel Otto William Alexander Elsner, C.B.E., D.S.O., L.R.C.P.I., D.P.H., R.A.M.C. retd, aged 81.

HAYMAN.—On Jan. 9, at Sharnbrook, Bedford, Frank Keith Hayman, M.B. Lond., F.R.C.S., formerly of Great Yarmouth, aged 59.

MARCH.—On Jan. 14, Charles March, M.B. Glasg., of Gerrards Cross, Bucks, aged 40.

RAHILLY.—On Dec. 30, in Southborough, near Tunbridge Wells, John Maurice Bisdee Rahilly, O.B.E., M.B. Lond., lieut-colonel, R.A.M.C. retd.

TINDAL-ATKINSON.—On Jan. 14, Wilfred Percy Tindal-Atkinson, M.R.C.S., of Fair Green, Sawbridgeworth, Herts, aged 68.

WILSON.—On Jan. 14, at Cheltenham, Sarah Wilson (née Kaye), M.B. Lond., aged 85.

Notes and News

W.H.O. EXECUTIVE BOARD

WHEN the 11th session of the executive board of the World Health Organisation opened in Geneva on Jan. 12, the chairman, Lieut.-Colonel M. Jafar, director-general of health, Pakistan, expressed grave concern at the organisation's financial position. Because of action by the United Nations Technical Assistance Board, he said, "we are to be asked or have already been asked to cut down expenditure on our existing projects, and reduce them as much as possible in the future. This reduction is bound to have serious repercussions." Speaking of governments participating in health projects, the chairman said: "It would be an impossible position to tell them now that W.H.O. cannot meet its commitments any more. The U.N. Technical Assistance Programme, as we are all aware, was planned to bring in the element of international assistance, as against bilateral. Any interference with it at this stage will mean a reversal of the policy which has encouraged national governments a great deal so far." The chairman went on to declare that it seemed that health had been given a back number in the sphere of social and economic development. "If this is the attitude, it is very difficult to understand how development in agriculture, food production, industrialisation, or the availability of healthy labour can go ahead without proper development in the field of health." The chairman remarked that a second very important item on the agenda was the nomination of a new director-general to succeed Dr. Brock Chisholm, who is retiring in July. The board is to meet privately on Jan. 26 to decide on a nomination for the post; this nomination will be placed before the sixth World Health Assembly, which opens in Geneva in May.

At a later session Dr. A. T. Shousha, director for the Eastern Mediterranean Region, reported that the regional committee had been unable to meet since 1950 because of the political situation; the Arab League had decided that no regional meeting at which Israel was represented should be attended by its member governments.

SIXTH INTERNATIONAL CONGRESS FOR MICROBIOLOGY

THE first International Congress for Microbiology was held in 1930 in Paris. The second, planned for Berlin in 1933, had to be postponed because of political events, and it was eventually held in 1936 in London. At the outbreak of war in September, 1939, the third congress took place in New York; the fourth was in Copenhagen in 1947; and the fifth in Rio de Janeiro in 1950. The next congress is to be held this year from Sept. 6 to 12 in Rome, and the preliminary programme has now been issued by the organising committee.

Membership of the congress is open to "all persons interested in the subject of microbiology." There is a registration fee of 12,000 lire, or 10,000 lire for members of a scientific society. Registrations should be sent to the secretary of the congress, Instituto di Igiene "G. Sanarelli," Città Universitaria, Rome, before May 31.

The congress opens on Sunday, Sept. 6, at 10 A.M.; there will be scientific sessions from 8.30 A.M. to 12.30 P.M. and 3.30 to 6 or 6.30 P.M. each day except Thursday, Sept. 10, which is left free for an excursion. The closing session will be on Saturday, Sept. 12, at 4 P.M., followed by the official banquet (5000 lire) at 9 P.M.

Any member may give a paper to a section, and he should submit the title and two copies of an abstract (not more than 500 words) to the secretary before April 30. Fifteen minutes will be allowed for each paper.

Lectures by invited speakers will be given on bacterial cytology; microbial metabolism; nutrition and growth factors; growth inhibitors and chemotherapy; morphology, biology, and systematics of the actinomycetales; and host-virus interactions.

MEDICINE IN THE SUDAN

THE report of the Sudanese medical services for 1950–51 is an excellent skeleton. The bare bones of accomplishments in preventive medicine, in medical education, in research, and in the hospitals are shown in 34 tables supported by a brief factual text.

For a population of just under 9 million people there is a health budget of over £2 million and an established medical staff of 1275 people, of whom 116 are British and about 160

doctors. During the year there were 303,000 admissions to hospital, and 31,000 operations were performed. There was a major epidemic of meningococcal meningitis with 57,000 cases. Over 350,000 patients were treated for malaria, and in nearly 25,000 a blood film proved positive. In the Gezira irrigated area some 17% of the population are infected with schistosomiasis. There are 35 students in the Kitchener School of Medicine. Over 38,000 routine bacteriological and serological tests were carried out.

These real achievements are set out so briefly and with so little comment that only a reader experienced in tropical medicine will grasp that the Sudanese people have the benefit of a small but efficient and progressive medical service. For the ordinary reader the report lacks flesh and blood. In the Sudan today exciting battles are being fought against malaria, meningococcal meningitis, schistosomiasis, tuberculosis, malnutrition, and maternal ignorance. Could not next year's report describe some of the highlights of the campaigns in language which all can understand? Some pictures would help us to appreciate the work. The work is of interest and importance to us all today, when departments of African governments are liable to fall suddenly within the searchlight of world opinion. And proper judgments for future policies can only be formed if educated people, both in Africa and in the world outside, know something about African technical problems.

ART FROM MENTAL HOSPITALS

LAST May an exhibition of amateur paintings organised by the Society for Education in Art included a large section devoted to entries from mental hospitals; and a collection of paintings and sculptures by psychiatric patients is at present being exhibited at the Geffrye Museum, Kingsland Road, London, and will remain on view until Feb. 1. Among the sculptures, a moving series of fourteen carvings depicting the way to the Cross were previously shown at the S.E.A. exhibition. These are the work of a young woman patient—a professional artist—at Netherne Hospital, Coulsdon. The paintings are from Leavesden Hospital, where art-therapy sessions have been held weekly for nine months. Many of the patients whose work is shown are mental defectives with mental ages from about nine years downwards (on scale 1 of the Wechsler-Bellevue intelligence test); but the speech of some of them was so poor that they could not be tested. "It came as a surprise," according to a note in the catalogue, "to discover that many of these patients were capable of spontaneous activity. They really enjoyed the painting sessions—the mere application of colour to paper had its effect upon them." The note adds that much of their initial restlessness and uncertainty of conduct disappeared while they were painting.

The National Association for Mental Health have set up a subcommittee which, during the past year, has been inquiring into the position of art-therapy in mental hospitals, its aims and functions, and the qualifications desirable in those who practise it. Doctors have long recognised that a patient's paintings may reflect the progress of his illness remarkably faithfully—sombre colouring and subjects giving place to livelier tones and more cheerful themes, for instance, as he comes out of a depression and regains his normal mood. Art in mental hospitals has thus been regarded as contributing to diagnosis, rather than as a form of therapy; yet it almost certainly has therapeutic value too. An interim memorandum outlining some of the difficulties and complexities of the subject has been prepared and presented to the main committee of the association, but has not yet been made public.

CENTENARY IN BAVARIA

IN the first half of the 19th century Bavarian doctors began to feel a need for greater cohesion and opportunity for sharing experience. Accordingly, in 1833 twenty doctors set up the Münich Medical Society. Several attempts to publish regularly a Bavarian medical journal ended in failure; but at the end of 1852 Dr. Alois Martin, probably inspired by Hermann Oettinger, announced his intention of founding another such journal, and after some delay the first issue appeared on Jan. 7, 1854, under the title *Aerztliches Intelligenzblatt: Organ für Bayerns staatliche und öffentliche Heilkunde*. Martin retired in 1869. In 1885 Bernhard Spatz took over the appointment, and in 1886 the title was changed to *Münchener Medizinische Wochenschrift*. The change was in more than the title; for under Spatz's wise leadership the journal increased its scope and became known and read by many beyond the range of Bavaria. In the jubilee issue of the journal (Jan. 2, 1953) G. B. Gruber recalls that in its time it has published much well-known original work. Between 1944 and 1950 publication was suspended; but, as Gruber shows, the circulation is rapidly climbing back towards the 1944 peak of 18,000. Dr. Hans Spatz, the son of Bernhard Spatz, now shares the editorship with Prof. Georg Landes.

JOURNAL OF EMBRYOLOGY AND EXPERIMENTAL MORPHOLOGY

AN editorial board has lately been at work preparing the way for a new quarterly journal, the *Journal of Embryology and Experimental Morphology*. The first issue is planned for the coming spring. The editorial board, a strong international team, has decided that the scope of the new journal shall include "work on embryogenesis, growth, and developmental processes in the older organism as well as studies on fœtal-maternal relationships." Most articles will be in English, though some in French and German will also be included. The editor is Mr. M. Abercrombie, M.A., reader in embryology in the University of London. Prof. J. Z. Young, F.R.S., is chairman of the editorial board, and Mr. D. R. Newth, PH.D., lecturer in the department of zoology, University College, London, is its secretary.

University of Cambridge

On Dec. 23 the following degrees were conferred by proxy:

M.B., B.Chir.—C. W. M. Adams, L. P. Balfour-Lynn, W. M. Beatley, M. H. Bennett, D. W. K. Bird, G. M. P. Boyes, D. A. P. Burton, W. H. Chapman, H. S. Chen, R. C. Curry, S. H. Dallas, Aileen B. Donnison, J. A. Fiddian, S. J. Fisher, D. B. Fox, Hanna French, A. M. B. Golding, R. K. Greenwood, J. M. S. Grieve, A. N. Griffith, H. F. Grundy, R. D. Hernaman-Johnson, M. D. Heyman, Vera M. C. B. P. Hollyhock, B. L. Hoskyns, B. S. Jay, H. E. Lichtenstein, I. S. Lister, Gillian G. Matthews, P. L. Maybury, R. L. Morgan, K. F. Morrice, T. M. O. Morris, M. T. O'Donnell, E. M. Orton, J. T. H. Pick, J. F. Preece, P. M. H. Rack, Frederic Reisner, T. L. Ringrose, R. D. W. Romanis, W. A. G. Roper, C. S. Savage, T. L. Scully, E. P. Simkin, I. F. Smith, I. A. Stewart, G. D. Stones, L. J. Stretton, M. C. Thornton, D. S. Trouton, J. A. M. Tudor-Hart, Ruth M. Turner, A. E. Wagstaff, H. C. M. Walton, A. W. Warltier, P. A. Watt, Ian Weinbren, F. L. Whalley, W. G. Williams, J. O. Winter.

Dr. A. D. Gardner, F.R.C.P., regius professor of medicine in the University of Oxford, will deliver the Rede lecture in the Senate House, at 5 P.M., on Thursday, May 14. He will speak on the Proper Study of Mankind.

University of London

Prof. P. Mallet-Guy of the department of surgical pathology, University of Lyons, will deliver a lecture at St. Mary's Hospital Medical School, Paddington, W.2, at 5 P.M. on Thursday, March 5. He will speak in French on Les Opérations Sympathiques dans le Traitement des Pancréatites Chroniques Récidivantes.

University of Sheffield

On June 26 the honorary degree of D.SC. will be conferred on Sir Ernest Finch, formerly professor of surgery in the university.

Scottish Society of Anæsthetists

The annual meeting of this society will be held at Dunblane Hotel Hydro from the evening of Friday, April 24, until Sunday, April 26, under the presidency of Dr. W. M. Shearer. Dr. I. W. Magill will be a guest of the society.

Liverpool Medical Exhibition

On Monday, May 18, at 11.30 A.M., Dr. E. Noble Chamberlain will open this exhibition at St. George's Hall, Liverpool. Only doctors will be admitted, and the exhibition will be open daily from 11 A.M. to 6.30 P.M. until May 22.

Institute of Psychiatry, London

On Monday, Feb. 2, at 8 P.M., at this institute at the Maudsley Hospital, Denmark Hill, S.E.5, Prof. Konrad Lorenz (Max Planck Institute, Buldern, Westphalia), will deliver a lecture on Comparative Psychology and Psychiatry. On Feb. 6, at 3 P.M., Prof. H. C. Rümke (Utrecht) will give a lecture on the Clinical Significance of Obsessional Phenomena.

Conference on World Health

The United Nations Student Association is holding a conference on this subject on Saturday, Feb. 7, at 2.15 P.M., at 16, Queen Anne's Gate, London, S.W.1. The speakers will include Dr. Neville Goodman, Dr. Harold Balme, and Dr. C. H. Andrewes, F.R.S. Further particulars may be had from UNSA, 25, Charles Street, W.1.

College of General Practitioners

By Jan. 15 over 1000 doctors had joined the newly formed college. The address of the college is 14, Black Friars Lane, Queen Victoria Street, London, E.C.4.

British Association of Urological Surgeons

This association's annual meeting is to be held in Leeds on June 25–27. The proceedings are to include a discussion on Urinary Tuberculosis, which will be opened by Mr. J. Cosbie Ross.

Laboratory Animals Bureau Congress

The sixth congress of the bureau is to be held at the Royal Veterinary College, London, N.W.1, on Friday and Saturday, March 27 and 28. Sir Harold Himsworth, secretary of the Medical Research Council, will give the opening address.

Oxford Graduates Medical Club

The winter dinner of this club will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Friday, Jan. 30, at 7 P.M., when Sir Rudolph Peters, F.R.S., will be in the chair. Tickets (30*s.*) may be had from Mr. Selwyn Taylor, 3, Roedean Crescent, Roehampton, S.W.15.

Psychology of Eating

The Scottish group of the Nutrition Society will hold a meeting on Saturday, Jan. 31, at 1.20 P.M. at Marischal College, Aberdeen, when this subject will be discussed. The speakers will include Prof. W. M. Millar, Prof. C. F. W. Illingworth, Dr. C. F. Rolland, Dr. J. M. Walker, and Dr. C. G. Kennedy. Further particulars may be had from Dr. E. C. Owen, Hannah Dairy Research Institute, Kirkhill, Ayr.

King Edward VII's Hospital for Officers

Lieut.-Colonel Claude Shepherd has compiled, at his own expense, an historical record of the first 50 years of this hospital for Service officers, which was founded by Miss Agnes Keyser during the Boer War. Copies (2*s.* 6*d.*) may be had from the hospital, Beaumont House, Beaumont Street, London, W.1, and all proceeds will go to the funds of the hospital.

French Exchange Scholarships

Under a reciprocal arrangement with the Centre National de la Recherche Scientifique, the Medical Research Council invite applications from British workers in medical science, excluding clinical medicine, for two scholarships tenable at research institutions in France during 1953–54. The stipend of the scholarships will be 45,000–90,000 francs a month, according to qualifications and experience, and married men will receive a supplementary allowance. Forms of application may be had from the secretary of the council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31, 1953.

Appointments

ANDERSON, A. B., M.B. Lpool: asst. school M.O., Stoke-on-Trent.
ARTHUR, W. D., M.R.C.S.: appointed factory doctor, Wellingborough Northamptonshire.
ELLIOTT, C. G., B.M. Oxfd: appointed factory doctor, Aylsham, Norfolk.
LITTLE, D. CRAWFORD, M.B. Manc., M.R.C.P., D.C.H.: asst. chest physician, (S.H.M.O.), Caernarvon and Anglesey H.M.C.
MURRAY, C. P., M.B. Aberd.: airport M.O., London and Northolt airports for control service (Middlesex County Council).
MURRAY, F. J. A., L.R.C.P.I., D.P.H.: asst. M.O. and M.O.H., Stone urban district.
O'CONNOR, NORA, M.B. N.U.I., D.P.H., D.C.P.: asst. pathologist, Boston General Hospital.
PILKINGTON, T. L., M.R.C.S., D.P.M.: asst. psychiatrist, Middlewood Hospital, Sheffield.
SHAW, PATRICIA, M.D. Lond., D.P.H., barrister-at-law: senior M.O., Nottingham.
THOMSON, W. N., M.B. Aberd., F.F.R., D.M.R.D.: consultant radiologist, Edinburgh northern hospitals.
WARWICK, ELSPETH, M.B. Edin., D.P.H.: deputy M.O.H., Nottingham.

Newcastle Regional Hospital Board:

DOBERMAN, HENRY, M.B. Durh., M.R.C.O.G.: consultant obstetrician and gynecologist (asst.), Sunderland H.M.C. group.
DUGGAN-KEEN, G. E., M.R.C.S., D.P.M.: medical superintendent and consultant psychiatrist, Winterton Hospital, Sedgefield.
GORDON, HELEN, M.B. Aberd., D.A.: consultant anæsthetist, North West Durham H.M.C.
HELLER, A. D., M.D. Zagreb., M.D., D.P.M. Prague: asst. psychiatrist, Prudhoe and Monkton mental deficiency hospital.
TEES, J. E., M.R.C.S., D.A.: consultant anæsthetist, North West Durham H.M.C.

Diary of the Week

JAN. 25 TO 31

Monday, 26th

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, S.E.5
5.30 P.M. Dr. E. Stengel: Psychiatry lecture-demonstration.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Mr. W. J. Dempster, Mr. B. W. Rycroft, Mr. A. L. Schofield: Homologous Tissue Transplantation.

MANCHESTER MEDICAL SOCIETY
5 P.M. (University of Manchester.) *Section of Odontology.* Prof. Wilfrid Gaisford: Oral Pædiatrics.
9 P.M. *Section of General Practice.* Dr. S. Almond: Some Cardiovascular Fallacies.

Tuesday, 27th

UNIVERSITY OF LONDON, London Hospital Medical College, Turner Street, E.1
5.30 P.M. Prof. A. Claude (Brussels): Technical Aspects of Cell Research. (First of two lectures.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Sir Frederic Bartlett, F.R.S.: Nature and Place of Thinking in Medicine.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Sections of Medicine and General Practice.* Sir James Spence, Dr. R. J. F. H. Pinsent, Brigadier G. P. Hardy-Roberts: Function of the Hospital Outpatient Department.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. P. Wade: Treatment of the Epithelioma.

WEST END HOSPITAL FOR NERVOUS DISEASES, 40, Marylebone Lane, W.1
5.30 P.M. Mr. J. Minton: Ocular Manifestations in Nervous Disease: Part II.

Wednesday, 28th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Section of Endocrinology.* Dr. J. W. Litchfield, Dr. W. S. Peart, Mr. A. Dickson Wright: Phæochromocytoma.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Precancerous Conditions of the Skin.

INSTITUTE OF UROLOGY, St. Paul's Hospital, Endell Street, W.C.2
4.30 P.M. Dr. R. Thomson: Laboratory Aids to Diagnosis.

ILLUMINATING ENGINEERING SOCIETY
6 P.M. (Royal Institution, Albemarle Street, W.1.) Prof. E. D. Adrian, O.M., P.R.S.: Nervous Reactions of the Retina. (Trotter-Paterson lecture.)

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow, C.2
5 P.M. Prof. E. J. Wayne: Heart in Endocrine Disease. (Finlayson lecture.)

Thursday, 29th

UNIVERSITY OF LONDON
5.30 P.M. Professor Claude: Morphological and Biochemical Aspects of Cell Structure and Function. (Second of two lectures.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Sir Alexander Fleming, F.R.S.: Recent Progress in Antibiotics.

INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Mr. H. S. Sharp: Upper Respiratory Tract Disorders.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Sir Geoffrey Todd: Modern Methods in Treatment of Pulmonary Tuberculosis.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, S.W.1
5 P.M. Sir Paul Mallinson: Psychiatry lecture-demonstration.

UNIVERSITY OF EDINBURGH, New Buildings, Teviot Place, Edinburgh
5 P.M. Prof. Jean Fiolle (Aix-Marseilles University): Embolism of Arteries of the Limbs.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Medical School, Small's Wynd, Dundee.) Prof. J. M. Mackintosh: Medical Care Tomorrow.

Friday, 30th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.30 P.M. Prof. F. Bergel, PH.D.: Chemical Aspects of Normal Growth. (Second of three lectures.)

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. G. B. Mitchell-Heggs: Acne Vulgaris, Acne Excoriée, and Dermatitis Artefacta.

EMERGENCY BED SERVICE.—In the week ended last Monday applications for general acute cases numbered 1700. The proportion admitted was 83·97 %.

Dr. A. W. C. Bennett, who has been medical officer to the former Great Western Railway and the western region of British Railways at Swindon for the past 23 years, retired on Dec. 31.

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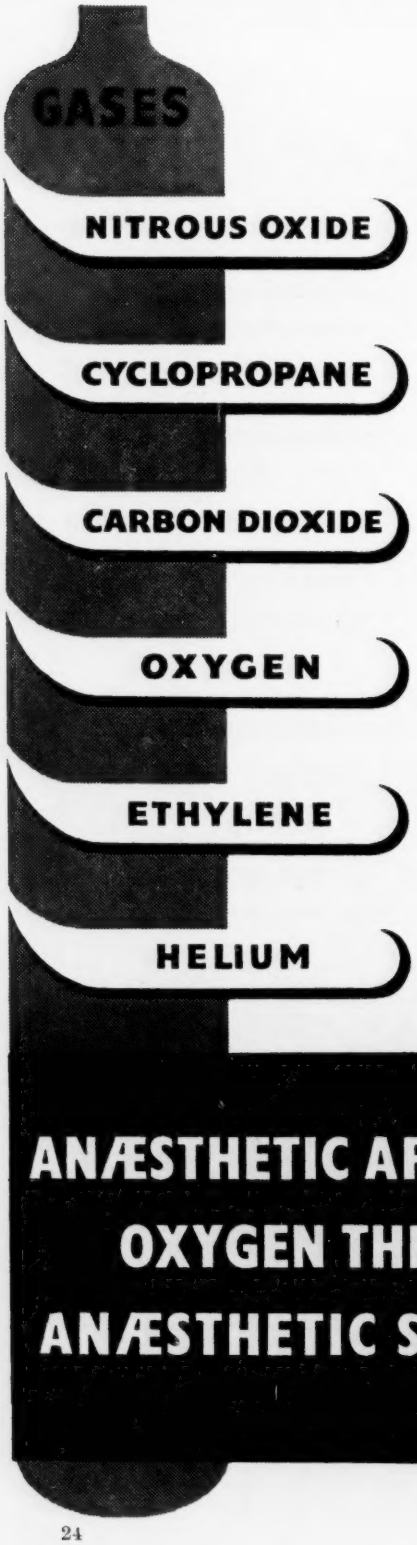

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Academic and Educational

FACULTY OF ANÆSTHETISTS
ROYAL COLLEGE OF SURGEONS OF ENGLAND

LECTURES IN PHARMACOLOGY, MARCH, 1953

A Course of 20 Lectures in Pharmacology will be held at the College from 2ND to 6TH MARCH, inclusive.

The Lectures will be held on each day at 10 A.M.; 11.30 A.M.; 2 P.M.; and 3.30 P.M., and will be given by Prof. C. A. KEELE, Dr. H. C. STEWART, and Dr. A. H. GALLEY.

The fee for the Course will be 6 guineas or 10s. per single lecture.

Application should be made to the Secretary of the Faculty, accompanied by the appropriate fee.

W. F. DAVIS, Secretary.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

A COURSE in the BASIC SCIENCES (anatomy, physiology, pathology, including bacteriology) will be conducted by the Fellows of the College and others, under the ægis of the Edinburgh Post-Graduate Board for Medicine.

The course, comprising lectures and demonstrations, will begin on 6TH APRIL, 1953, and will continue for 10 weeks. Fee 25 guineas.

Applications for enrolment, or further particulars regarding this course, should be addressed to The Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8.

UNIVERSITY OF LONDON
BRITISH POSTGRADUATE MEDICAL FEDERATION
THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY
330/332, Gray's Inn-road, London, W.C.1

AN INTENSIVE COURSE IN ENDOSCOPY for senior students and practising members of the specialty will be given from 13TH to 18TH APRIL, 1953.

The course will be a whole-time one and will include practical work. Fee £10 10s.

Detailed syllabus obtainable from the Dean.

UNIVERSITY OF LONDON

MARY SCHARLIEB RESEARCH STUDENTSHIP

The University will shortly proceed to award the Mary Scharlieb Research Studentship, of the value of £250, for 1 year in the first instance. The Studentship is open to Graduates of the University who are registered medical practitioners or possess qualifications which in the opinion of the Senate would enable them to undertake postgraduate medical research.

Applications (on a prescribed form), must reach the Academic Registrar, University of London, Senate House, London, W.C.1 (from whom a form of application and further particulars may be obtained), not later than 28th February, 1953.

UNIVERSITY OF LONDON

2 LECTURES will be delivered by Prof. A. CLAUDE (Brussels) at 5.30 P.M. on 27TH and 29TH JANUARY at London Hospital Medical College, Turner-street, E.1.

27th January: "Technical Aspects of Cell Research."

29th January: "Morphological and Biochemical Aspects of Cell Structure and Function."

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE
DEPARTMENT OF MEDICAL STATISTICS AND EPIDEMIOLOGY

The following courses will be held in March to June 1953:—

(1) COURSE IN MEDICAL STATISTICS AND EPIDEMIOLOGY, on the mornings of TUESDAYS and THURSDAYS, from 3RD MARCH to 9TH JUNE inclusive.

(2) COURSE IN STATISTICAL METHODS AND THEIR APPLICATION IN MEDICINE, on the mornings of WEDNESDAYS and FRIDAYS, from 4TH MARCH to 12TH JUNE inclusive.

Fee for each course 10 guineas, for both taken together 17 guineas. Students without a medical qualification can be accepted.

Application for admission must be made before 15th February. Details of the syllabus of each course can be obtained on request.

LUND RESEARCH FELLOWSHIPS

Applications are invited for 1953 for Part-time or Whole-time Fellowships in Research on Diabetes Mellitus. Value according to qualifications and experience.

Details of the proposed research and names of 2 referees should be sent to the Diabetic Association (Research), 152, Harley-street, London, W.1.

THE NUFFIELD FOUNDATION

MEDICAL FELLOWSHIPS

As part of its programme for the advancement of health the Nuffield Foundation is prepared to award a number of Fellowships to highly qualified men and women of the United Kingdom, usually between the ages of 25 and 35, who wish to train further for teaching and research appointments in any branch of medicine. Between equally qualified applicants preference will be given to those who wish to pursue an academic career in child health, social medicine, industrial health, psychiatry, and chronic rheumatism.

Applications for awards in 1953 must be received not later than 1ST MAY, 1953.

The conditions of these Fellowships and the application forms are obtainable from the Secretary, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1.

L. FARRER-BROWN,
Secretary of the Nuffield Foundation.

THE NUFFIELD FOUNDATION

FELLOWSHIPS AND SCHOLARSHIPS IN DENTISTRY

The Nuffield Foundation invites applications from citizens of the United Kingdom, for Fellowships and Scholarships in Dentistry. To help the advancement of teaching and research on dental health and disease, the Foundation is prepared to award a number of Fellowships

(i) to enable selected men and women with dental qualifications to receive such additional training in pure and applied science as is desirable to fit them for an academic career in dentistry, and

(ii) to enable selected university graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease.

The Foundation is also prepared to award a limited number of Scholarships to assist students of outstanding ability attending a university dental school to devote 1 or 2 years to further studies of the basic sciences.

Applications for Fellowships should be received by 1st March annually and for scholarships by 30th June annually. Copies of the conditions of both fellowships and scholarships and the application forms are obtainable from the Secretary, Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1.

L. FARRER-BROWN, Secretary of the Nuffield Foundation.

THE UNIVERSITY OF MANCHESTER
FACULTY OF MEDICINE

The Faculty of Medicine, in conjunction with the St. Mary's Hospitals for Women and Children, proposes to conduct a POSTGRADUATE COURSE IN OBSTETRICS, especially intended for general practitioners. The course is to comprise 11 consecutive weekly meetings to be held on WEDNESDAYS from 10 A.M. to 4 P.M., commencing on 11TH MARCH and concluding on 20TH MAY, 1953. The fee for the course is 10 guineas, though doctors taking part in the National Health Service may be able to claim the fee and travelling expenses from the Ministry of Health.

Application should be made to the Dean of Postgraduate Medical Studies, The University, Manchester, 13, not later than Monday, 16th February, 1953.

THE UNIVERSITY OF LEEDS

PART-TIME COURSE FOR CERTIFICATE IN PUBLIC HEALTH AND DIPLOMA IN PUBLIC HEALTH

A part-time Course for the Certificate in Public Health and the Diploma in Public Health will commence in October, 1953, occupying 2 terms for the Certificate and a further 3 terms for the Diploma. Students will require to spend 2½ days a week in each term in whole-time study, leaving the remainder of the time free for approved gainful employment. Candidates holding part-time Public Health appointments or with previous whole-time Public Health service may be granted exemption from some of the practical Public Health work, so reducing the whole-time study to approximately 2 days a week.

Candidates are asked to apply as soon as possible to the Sub-Dean, School of Medicine, Thoresby-place, Leeds, 2.

COURSE IN INFLAMMATORY DISORDERS OF BONES AND JOINTS
at the
INSTITUTE OF ORTHOPÆDICS
16TH–21ST FEBRUARY, 1953

16th Feb. .. Town Section	Histological reactions of skeletal and joint tissues in inflammatory disorders	..	Dr. H. A. SISSONS
	Arthroplasty and arthrodesis: general review	..	Mr. P. H. NEWMAN
	Rare types of bone infection	..	Mr. H. J. SEDDON
	Rheumatoid arthritis	..	Dr. E. G. BYWATERS
17th Feb. .. Country Section	Joint tuberculosis: Pott's paraplegia	..	Mr. H. J. SEDDON
	Bone and joint tuberculosis: Bacteriology	..	Dr. C. H. LACK
	Tissue pathology	..	Dr. H. A. SISSONS
18th Feb. .. Town Section	Osteomyelitis and septic arthritis pathology	..	Dr. H. A. SISSONS
	Osteomyelitis — treatment	..	Mr. V. H. ELLIS
	Septic arthritis—treatment	..	Mr. V. H. ELLIS
	Rare types of arthritis	..	Mr. H. J. BURROWS
19th Feb. .. Country Section	Joint tuberculosis: other joints	..	Mr. D. TREVOR
	Practical laboratory techniques of joint infections	..	Dr. C. H. LACK
	Ankylosing spondylitis	..	Mr. K. I. NISSEN
20th Feb. .. Country Section	Joint tuberculosis: chemotherapy	..	Dr. F. H. STEVENSON
	Joint tuberculosis: visceral complications	..	Dr. F. H. STEVENSON
	Joint tuberculosis: spine	..	Mr. J. A. CHOLMELEY
21st Feb. .. Country Section	Joint tuberculosis: hip	..	Mr. J. I. P. JAMES

The fee for the course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean, 234, Great Portland-street, London, W.1.

THE UNIVERSITY OF MANCHESTER. Applications are invited for the post of LECTURER IN MEDICAL PHYSICS. Candidates should be graduates in physics with research experience and should be interested in medical problems. Salary within the range £500–£1100 p.a. with membership of F.S.S.U. and Children's Allowance Scheme. Initial salary according to qualifications and experience.

Applications should be sent not later than 2nd March, 1953, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 6TH JULY, 1953. The following Examination will be held in December, 1953.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF LONDON. The Senate invite applications for the CHAIR OF PHYSICS applied to Medicine tenable at Guy's Hospital Medical School (salary not less than £1800 a year).

Applications (10 copies), must be received not later than 25th February, 1953, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

GUY'S HOSPITAL MEDICAL SCHOOL. Applications are invited for an additional Full-time RESEARCH FELLOWSHIP in the Thoracic Surgical Unit for research on cardiovascular problems. It is desirable that applicants should possess a higher qualification in surgery. Salary (in the range £775–£1100) will depend upon the experience of the person appointed.

Applications, with the names of 3 referees, should be sent to the Dean, Guy's Hospital Medical School, London Bridge, S.E.1, not later than 31st January, 1953.

ST. MARY'S HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON), Paddington, W.2. Applications are invited for the appointment of ASSISTANT in the Medical Unit with effect from 1st April, 1953, for a period of 3 years. Salary £900–£100–£1100 plus superannuation and family allowances.

Applications (2 copies), with names of 3 referees, should be submitted by 14th February, 1953, to the Secretary, from whom further particulars may be obtained.

UNIVERSITY OF LONDON KING'S COLLEGE requires a LECTURER IN PHYSIOLOGY. The appointment will be on the Junior Lecturer scale of £600–£50–£750, with family allowances and F.S.S.U. benefits, and may date from the beginning of the Summer term or from 1st October, 1953.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2, whom completed applications should reach by 14th February.

UNIVERSITY OF LIVERPOOL. Departments of Gynæcology and Pathology. Applications are invited for the post of SPECIAL LECTURER IN NEOPLASTIC DISEASES. The primary duty of the successful applicant will be to conduct research into malignant and premalignant changes in the cervix uteri, the work to be carried out under the direction of the Professors of Gynæcology and Pathology. Applicants should have had at least 2 years experience in general histological pathology. The commencing date and tenure of appointment will be agreed at the time of appointment, and the salary will be fixed according to experience and qualifications, within the range of £1000–£2000 p.a.

Applications, stating age, academic qualifications, and experience, together with the names of 3 referees, should be received not later than 14th February, 1953, by the undersigned, from whom further particulars of the conditions of appointment may be obtained.

January, 1953. STANLEY DUMBELL, Registrar.

UNIVERSITY OF BELFAST. The Senate of the Queen's UNIVERSITY OF BELFAST invites applications for a LECTURESHIP IN PREVENTIVE MEDICINE in the Department of Social and Preventive Medicine from 1st October, 1953. Salary £1300–£50–£1750 with provision for superannuation. In certain circumstances the salary may rise to £2000. Initial placing on the scale will depend on experience and qualifications.

Applications should be submitted by 20th February, 1953. Particulars from G. R. COWIE, M.A., LL.B., Secretary.

Hospital Services : Senior Appointments

CONNAUGHT HOSPITAL, Walthamstow, E.17. Locum CONSULTANT required in E.N.T. Department immediately to 19th March, 1953, for 3 sessions per week, all day Tuesday and afternoon Thursday.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, N.W.8. Applications are invited for the post of HONORARY SURGEON to the E.N.T. Department. Candidates must be Fellows of 1 of the Royal Colleges of Surgeons or hold the M.S.

Applications (25 copies), should be sent to the undersigned on or before 31st January, 1953. Testimonials are not required, but the names of 3 persons willing to act as referees should be furnished. Sister MARY CLARE, Secretary.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT CHILDREN'S SURGEON for 2 notional half-days in the Bromley Group of hospitals. The duties which will be at the Children's Hospital, Sydenham, will comprise 1 operating session and 1 outpatient session weekly, and emergencies. Candidates must have had wide experience in general surgery with particular reference to children's surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the Hospital concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th February, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGIONAL MEDICAL ADMISSIONS OFFICER to the Emergency Bed Service at the offices of the King Edward's Hospital Fund, 10, Old Jewry, E.C.2. The duties will be wholly administrative and will be concerned with the admission of patients to beds in the general and special hospitals in the Metropolitan Area. The Officer will be appointed to the staff of the Board and will be under the general direction of the Senior Administrative Medical Officer and will work in liaison with the Emergency Bed Service. Applicants should have held hospital appointments, and a knowledge of hospitals in the London Area is desirable. Salary will be on the scale £1250 (at age 33 or over)–£50–£1500 p.a., plus a London weighting allowance of £50 p.a. The appointment will be for a period of 1 year in the first instance and is subject to the provisions of the National Health Service (Superannuation) Regulations, 1950.

Applications, stating age, sex, qualifications and experience, together with the names and addresses of 3 referees, should be forwarded to the Secretary, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 7th February, 1953. Canvassing members of the Board will lead to disqualification.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST (Female), 1 half-day per week, at the Annie McCall Maternity Hospital, Jeffreys-road, S.W.4 (36 Beds), which has a tradition as a mission hospital. Successful candidate will share duties with another Consultant.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th February, 1953. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT OPHTHALMOLOGIST for 2 half-days per week—Queen Mary's Hospital, Carshalton, 1 half-day per week and Battersea and Putney Group (St. John's Hospital, S.W.11) 1 half-day per week. Separate applications in respect of either hospital would be considered.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th February, 1953. Applicants may visit hospitals by local arrangement.

ST. THOMAS'S HOSPITAL, London, S.E.1. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Joint appointment of an OBSTETRICIAN AND GYNÆCOLOGIST. 6 sessions per week of which 3 will be at Lambeth Hospital. Consultant status and membership of the Hospitals' Medical Committees.

Applications (12 copies), including names and addresses of 3 referees, to the Clerk of the Governors, St. Thomas's Hospital, by 21st February, 1953.

ST. THOMAS'S HOSPITAL, London, S.E.1. Radiologist. Consultant status with membership of the Medical Committee. 6 sessions per week.

Applications (12 copies), including names and addresses of 3 referees, to the Clerk of the Governors by 21st February, 1953.

CAMBRIDGE. UNITED CAMBRIDGE HOSPITALS. EAST ANGLIAN REGIONAL HOSPITAL BOARD. Part-time CONSULTANT DERMATOLOGIST to be appointed jointly by the 2 Boards for duties at Addenbrooke's Hospital and in the Region, initially for 6 sessions weekly.

Applications (12 copies), stating age, nationality, qualifications, and details of present and past appointments, with names of 3 referees, to Secretary, United Cambridge Hospitals, Addenbrooke's Hospital, Cambridge, by 11th February.

LEEDS REGIONAL HOSPITAL BOARD. Locum Senior HOSPITAL MEDICAL OFFICER required for Stanley Royd Mental Hospital, Wakefield (2000 Beds), and associated clinics. It is anticipated that the locum tenenship will be of at least 2 months duration.

Applications, stating age, qualifications, and details of experience, together with the names of 3 referees, should be forwarded to the Secretary to the Board, Park-parade, Harrogate, as soon as possible.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT E.N.T. SURGEON required for 7 half-days a week, 4 at Bedford General Hospital, Kimbolton-road, Bedford, and 3 at St. Albans City Hospital, St. Albans, Herts. Hospitals may be visited by direct appointment.

Detailed applications, including date of birth, and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 21st February, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time non-resident post of ASSISTANT ANÆSTHETIST to the Preston and Chorley Hospitals (Preston Royal Infirmary, Sharoe Green Hospital, Preston, and Chorley Hospital). Successful candidate will work under general guidance of Consultant. Salary £1300 (at age 32)–£50–£1750.

Application forms may be obtained from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, and should be returned to be received by 13th February, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time non-resident post of TUBERCULOSIS PHYSICIAN AND MEDICAL OFFICER in charge of the M.M.R. Unit based on Preston and covering North Lancashire, Blackpool and Barrow. Successful candidate will perform regular clinical duties in a Chest Team under general guidance of a Consultant. Salary £1300 (at age 32)–£50–£1750.

Application forms and further information can be obtained from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, and should be returned to be received not later than 9th February, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time non-resident post of ASSISTANT ANÆSTHETIST to work under the general guidance of the Group Consultant at the Barrow and Furness Hospital Centre (North Lonsdale and Roose Hospitals, Barrow; Ulverston Hospital, &c.). Salary £1300–£50–£1750. Successful candidate will be required to live in or near Barrow.

Application forms may be obtained from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, and should be returned to be received not later than 7th February, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT PSYCHIATRIST to St. Augustine's Hospital, Chartham Down, near Canterbury, to undertake 4 notional half-days a week, solely at outpatient clinics in Canterbury and East Kent. These clinics are for the long-term treatment of cases of psychoneurosis referred by other clinicians in Canterbury and East Kent. Applicants must have had wide experience in the treatment of psychoneuroses. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1. The last day for acceptance of applications will be 7th February, 1953.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer grade) at Milford Chest Hospital, near Godalming, Surrey. The duties of the successful candidate will include charge of postoperative surgical cases.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th February, 1953. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time DEPUTY PHYSICIAN SUPERINTENDENT AND CONSULTANT PSYCHIATRIST at St. Lawrence's Hospital, Caterham, Surrey (2250 Beds), a hospital for treatment and training of mental defectives of both sexes, of varying grades and types and of all ages. Outpatient Clinic held in Croydon. Candidates should possess D.P.M. and higher medical qualification, should have some administrative experience as well as wide knowledge of psychiatry and extensive experience in mental deficiency. Successful candidate will be required to reside in unfurnished house provided, appropriate charge being made.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th February, 1953. Applicants may visit Hospital by local arrangement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the appointment of Part-time ASSISTANT OPHTHALMOLOGIST based at the Eye Infirmary, Glasgow, and with other duties as may be determined. Salary will be on the scale of £1300–£50–£1750 and the number of sessions will be 8. The above appointment will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications and experience, and present appointment, and giving the names of 3 referees, should be submitted not later than 30 days after the publication of this advertisement to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners holding the Diploma in Anæsthetics for the post of maximum Part-time CONSULTANT ANÆSTHETIST with approximately 3 notional half-days per week at the Barnsley Hospitals and approximately 5 notional half-days per week at the Montagu Hospital, Mexborough.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Completed forms should be returned to the Secretary not later than 21st February, 1953.

ST. ALBANS CITY HOSPITAL, Normandy-road, ST. ALBANS, HERTS. Locum SENIOR HOSPITAL MEDICAL OFFICER required immediately for an indefinite period to the Department of Morbid Anatomy at the above Hospital. Salary according to the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, giving age, qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale), at Whitchurch Hospital, Whitchurch, Glam. The Hospital provides all modern methods of treatment and accommodates approximately 799 patients (male and female). Candidates should hold the D.P.M. and have had a wide experience in psychiatry. The successful applicant will work under the direction of the Consulting Psychiatrists.

Applications (12 copies), stating date of birth, giving a summary of qualifications, experience, previous appointments with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of an ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale), at Morgannwg Hospital, Bridgend. The Hospital provides all modern methods of treatment and has active outpatient clinics including a Child Guidance Clinic, and there is a Psychological Department. Candidates should preferably hold the D.P.M. and have had a wide experience in psychiatry. The successful applicant will work under the direction of the Consultant Psychiatrist. Accommodation is available.

Applications (12 copies), stating date of birth, giving a summary of qualifications, experience, previous appointments with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT ANÆSTHETIST to serve the Clwyd and Deeside and the Caernarvon and Anglesey Hospital Management Committee Areas, working mainly in the Llandudno and Colwyn Bay districts. Candidates must be in possession of the Diploma in Anæsthetics and have had a wide experience in the specialty. The successful candidate will be asked to state whether he wishes to hold a whole-time or maximum part-time appointment.

Applications (12 copies), stating date of birth, giving a summary of qualifications, experience, previous appointments with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the whole-time post of PSYCHIATRIST in the grade of Senior Hospital Medical Officer to the Authority's Special Care Service. The successful applicant will be required to undertake duties in connection with the Special Care Scheme under the Mental Health Act (Northern Ireland), 1948, for persons suffering from arrested or incomplete development of mind. The terms, conditions of service, and remuneration for the post will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned to him so as to be received not later than 14th February, 1953.

NEW ZEALAND. AUCKLAND HOSPITAL BOARD. Applications are invited from medical practitioners with the necessary qualifications for the status of either "Junior" or "Senior Specialist" for the position of RADIOLOGIST, Board's Institutions. Applicants must be qualified medical practitioners of the British Commonwealth and the appointee shall be registered in New Zealand before taking up duty. Salary: "Junior Specialist" £1290 rising to £1590 p.a. by annual increments of £50. "Senior Specialist" £1690 rising to £1940 p.a. by 2 annual increments of £100 and 1 of £50. (Commencing salary within these scales according to qualifications and experience in the specialty.) Living accommodation is not provided. Particulars regarding payment by the Board of travelling expenses are set out in the conditions of appointment, which, together with application forms, may be obtained from the office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2.

Applications, addressed to the Secretary, close at the office of the Board, Kitchener Street, Auckland, New Zealand, at NOON on Wednesday, 11th March, 1953.

R. F. GALBRAITH, Secretary.

Hospital Services : Junior Appointments

ALBERT DOCK TRAUMATIC AND ORTHOPÆDIC HOSPITAL, Alnwick-road, E.16. There will be a vacancy on 1st March, 1953, for a RESIDENT ORTHOPÆDIC AND TRAUMATIC REGISTRAR (temporary, pending permanent appointment). Salary not less than £16 per week. Married quarters available.

Applications, stating age, nationality, qualifications and experience, and enclosing 3 recent testimonials, should reach the undersigned not later than 11th February.

F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, S.E.10.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident), House Officer grade.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade) required from 9th February, 1953.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of RESIDENT MEDICAL OFFICER (Registrar grade). Candidates must have held a resident hospital appointment and not be under 25 years of age. Appointment is for 3 years commencing 1st April, 1953.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 7th February to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st April. Duties include work in Outpatient Department and wards. Salary £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 7th February to KENNETH A. F. MILES, House Governor.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEONS (2), resident, from 11th February and 1st March.

Apply, Hospital Secretary by 27th January, enclosing copies of 3 recent testimonials.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. CENTRAL GROUP NO. 5 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT TEMPORARY SENIOR REGISTRAR in Obstetrics and Gynæcology at the above Hospital, which is tenable for 3 months in the first instance and is subject to the terms and conditions of the National Health Service.

Applications, stating age, nationality, qualifications, and details of present and previous appointments, together with names of 3 referees, to be sent to the Secretary, Central Group, 213, Kingsland-road, London, E.2, by 31st January, 1953.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR REGISTRAR (first year), commencing on 1st April, 1953, at the above Post-graduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Candidates should have a higher medical qualification and experience in psychiatry is essential. Opportunities for research are available.

Applications, giving details of experience, and the names of 3 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of REGISTRAR, commencing on 1st April, 1953, at the above Postgraduate Teaching Hospital with which is associated the Institute of Psychiatry (University of London). Candidates with postgraduate experience in general medicine and neurology or in psychology will receive special consideration.

Applications, giving details of experience, and the names of 3 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, London, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER, commencing on 1st April, 1953, at the above Post-graduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Applicants should intend to take a full training in psychiatry and should have held a resident appointment in a general hospital. Graduate experience in general medicine and neurology or in the basic sciences is an advantage.

Applications, giving details of experience, and the names of 3 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL AND CANE HILL HOSPITAL. Applications are invited from registered medical practitioners for appointment as SENIOR REGISTRAR (first year), commencing 1st April, 1953, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). The successful candidate, subject to his qualifying for annual renewal, will serve his first 2 years at the Bethlem Royal Hospital and the Maudsley Hospital, and his remaining 2 years at Cane Hill Hospital. Candidates should have a higher medical qualification and experience in psychiatry is essential. Opportunities for research are available.

Applications, giving details of experience, and the names of 3 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON (C.H.), House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER in Obstetric and Gynæcological Department. Appointment for 6 months from 20th February, 1953. Post approved for M.R.C.O.G.

Applications, with copies of 2 testimonials, to Medical Director by 31st January.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Medical and Cardiological Department. Appointment for 6 months from 22nd March, 1953.

Applications, with copies of 2 testimonials, to Medical Director by 31st January.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. (General Hospital of 149 Beds.) There will be a vacancy for HOUSE SURGEON (pre-registration) on Saturday, 28th February.

Applications, stating qualifications, age, experience, and nationality, together with names of 3 recent referees, should reach the undersigned on or before 14th February.

F. A. LYON, Secretary,
Seamen's Hospital Management Committee.
Dreadnought Hospital, S.E.10.

HACKNEY HOSPITAL, E.9. (811 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST (resident). The post is recognised for the D.A. examination and is now vacant; the successful applicant will also be required to carry out duties at other hospitals within the Group.

Applications, with copies of 3 testimonials, should reach the Group Secretary, Hospital Management Committee, Hackney Hospital, E.9, by 7th February, 1953, quoting reference HH/SHO.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, London, W.12. HOUSE OFFICER (obstetrics) required 1st April.

Applications, stating age, qualifications, experience, copies of 2 testimonials, to Secretary, Board of Governors, by 7th February.

HIGHLANDS HOSPITAL, Winchmore Hill, London, N.21. HOUSE PHYSICIAN required, now vacant. Preference given to applicants seeking pre-registration posts under Medical Act, 1950.

Applications, with copies of 3 testimonials, to Hospital Secretary.

HOSPITAL FOR WOMEN, Soho-square, W.1. (Affiliated to the Middlesex Hospital.) Applications are invited for a full-time post of RESIDENT SENIOR GYNÆCOLOGICAL HOUSE OFFICER, vacant on 1st April, 1953. Appointment is for 6 months, but the holder can apply for an extension of 6 months Salary in accordance with the terms laid down for medical and dental staffs, less a deduction of £100 p.a. for residential emoluments. The appointment is recognised for the M.R.C.O.G. examination.

Applications, stating age, nationality, qualifications, and experience, supported by the names and addresses of 3 referees, must reach the undersigned not later than Saturday, 14th February. D. C. EMERY, Secretary.

FOREST GATE HOSPITAL, Forest-lane, London, E.7. Applications are invited for the resident post of HOUSE OFFICER (obstetrics), second or third post. The appointment is for 6 months, commencing 1st March, 1953, and is recognised for the training of candidates for D.Obst.R.C.O.G.

Written applications, together with 2 references, should be received by the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, not later than 14th February, 1953.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. Application invited for the post of RESIDENT HOUSE PHYSICIAN, vacant 10th February, 1953. Tenable for 6 months—renewable. Salary £350, £400, or £450 p.a., according to experience, subject to deduction at the rate of £100 p.a. for board, lodging, &c.

Applications, with copies of testimonials, to the Secretary at the Hospital.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Applications are invited from registered medical practitioners for 2 posts of RESIDENT OBSTETRIC HOUSE SURGEON (House Officer—second or third posts) which will be vacant on 1st March, 1953. The posts are recognised for the M.R.C.O.G. and are tenable for 6 months.

Applications, with full details, and copies of 3 testimonials, to the Group Secretary, Hospital Management Committee, Hackney Hospital, London, E.9, by 9th February, quoting reference MH/HS.

MIDDLESEX HOSPITAL, W.1. Applications invited for 2 posts of REGISTRAR (non-resident) to Radiotherapy Department.

Further particulars and application forms from Deputy Superintendent, to whom applications should be sent, naming 3 referees, by 14th February.

MILLER GENERAL HOSPITAL. (180 Beds.) Medical OFFICER in charge of Casualty Department, vacant approximately 25th February, 1953. 6 months appointment (renewable). Previous House Officer appointments essential. Salary £670 p.a., less deduction of £52 p.a. for meals taken whilst on duty.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, St. Alfege's Hospital, Greenwich, S.E.10.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. HOUSE OFFICER (resident) to the Neurosurgical Department at Maida Vale Hospital for Nervous Diseases, London, W.9. Appointment in the first instance for 6 months from 17th February, 1953. Grading as Senior House Officer or Registrar, according to experience.

Applications, with copies of 3 recent testimonials, should be addressed to the Secretary at Maida Vale Hospital, as soon as possible.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of SURGICAL REGISTRAR at The National Hospital, Queen-square, W.C.1, to commence on 1st April, 1953. This post carries the grade of Senior Registrar. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 21st February, 1953.

H. EWART MITCHELL, Secretary.
The National Hospital, Queen-square, W.C.1.

NELSON HOSPITAL, Kingston-road, Merton Park, S.W.20. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointments of RESIDENT HOUSE SURGEONS (2 posts). 1 vacant 3rd February, recognised for F.R.C.S. The other, vacant 10th February, is the junior of the 2 posts.

Apply, stating age, qualifications, experience, &c., together with copies of testimonials and the name of 1 referee, to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (179 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (House Officer—second or third post) for 6 months, commencing 1st March, 1953, in the Chest Unit and Infectious Diseases Unit at this Hospital. The position offers valuable experience in both groups of diseases and is particularly useful to candidates sitting for the M.R.C.P. examination.

Candidates should send applications to the undersigned, together with copies of recent testimonials, by 31st January, 1953. M. J. HUNTLEY, Group Secretary,
West Ham Group Hospital Management Committee.
Stratford, London, E.15.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident). Salary £400–£450 p.a. according to experience. The post is tenable for 6 months and the successful candidate will be required to take up his appointment as soon as possible.

Forms of application are obtainable from the House Governor, to whom applications (together with copies of 3 recent testimonials) should be sent not later than 9th February. Short-listed candidates will be required to attend for interview on 11th February.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON. There will be a vacancy (second or subsequent post) on 1st February, 1953. Appointment for 6 months with salary as laid down for House Officer grade in the terms and conditions of service under the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor immediately.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics), vacant 7th March, 1953. Occasional casualty duties involved.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials, to be sent to the Hospital Secretary by 6th February, 1953.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER. Applicants must not be more than 10 years qualified. The appointment is for 6 months, duties to commence on 1st March, 1953. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, London, W.C.1, to whom they should be returned not later than Friday, 6th February, 1953.

ROYAL EYE HOSPITAL, King's College Hospital Group. Applications are invited for the post of HOUSE SURGEON (third or subsequent post) from 1st March, 1953. Salary in accordance with terms and conditions of service for medical staff.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's Circus, S.E.1, by 6th February, 1953.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN vacant on 1st February.

Applications, stating age and qualifications, with copies of at least 1 testimonial, should be sent to the Medical Superintendent, St. Andrew's Hospital, Bow, E.3.

ST. THOMAS'S HOSPITAL, London, S.E.1. Assistant RADIOTHERAPIST. For 1 year in the first instance from 1st April, 1953. Salary £1575 p.a.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 31st January, 1953.

ST. THOMAS'S HOSPITAL, London, S.E.1. Assistant PSYCHIATRIST in the Children's Department (Child Guidance Clinic). For 1 year in the first instance from 14th March, 1953. 2 sessions per week (Mondays). £175 p.a. per weekly session.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 31st January, 1953.

ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOS-PITALS, W.C.2. RESIDENT SURGICAL OFFICER (Senior Registrar grade), required for St. Peter's Hospital on 1st April, 1953. Applications invited from Male candidates on the British register who have completed their training in general surgery. Appointment for 6 months, with opportunity for a further 6 months if recommended. Candidates should be prepared to spend 1 year at the Hospital if required.

Applications (12 copies), with 12 copies of 3 recent testimonials, should reach the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2, by 21st February.

ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOS-PITALS, AND THE INSTITUTE OF UROLOGY. A vacancy will occur on 1st March, 1953, for the combined post of RESIDENT SURGICAL OFFICER at St. Philip's and FOLLOW-UP OFFICER to the Institute. Grading, Registrar first year. Appointment for 6 months with opportunity for extension.

Apply in writing (6 copies) to House Governor, St. Peter's Hospital, Henrietta-street, W.C.2. Closing date 14th February.

SOUTH LODGE HOSPITAL, Worlds End-lane, N.21. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (first, second, or third post), resident or non-resident, required. Vacant now. For general duties as directed by the Medical Superintendent. National Health Service salary, plus £50 p.a.

Applications, in applicant's own handwriting, stating age, qualifications, experience and nationality, with the names and addresses of 2 referees, to the Medical Superintendent of the Hospital immediately.

WHIPPS CROSS HOSPITAL, Leytonstone, E.11. Leyton-STONE (NO. 10) HOSPITAL GROUP. Required at above Hospital, HOUSE PHYSICIAN.

Application forms from the Medical Superintendent to be returned by not later than 1st February, 1953.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. CASUALTY OFFICER (Senior House Officer) required, resident post, vacant 13th February, 1953, plus 14 days locum duties from 30th January, 1953. Salary £670 p.a., less £100 p.a. for residence.

Applications, with names of 2 referees, to Hospital Secretary by 29th January, 1953.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st April, 1953, for a HOUSE PHYSICIAN to the Neurological and Neurosurgical Department (Senior House Officer).

Further particulars and form of application, which must be returned not later than 9th February, 1953, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of ASSISTANT MEDICAL REGISTRAR for 1 year from 1st April, 1953. Post will be graded Registrar or Senior House Officer according to the experience of the successful candidate.

Applications, with names of 2 referees, to the Administrator and Secretary by 7th February, 1953.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of SENIOR REGISTRAR in the Dermatological Department, vacant on 1st April, 1953.

Applications, with names of 2 referees, to the Administrator and Secretary by 7th February, 1953.

ASHFORD (near), KENT. WILLESBOROUGH HOS-PITAL. Applications are invited for the appointment of HOUSE SURGEON which is now vacant at the above Hospital. Good experience in general surgery with some casualty work. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be forwarded to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD (near), KENT. WILLESBOROUGH HOS-PITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN which will become vacant on or about 3rd March, 1953, at the above Hospital. The person appointed will be required for duty in the Medical Wards and busy Out-patient Department under the supervision of Consultants visiting 4 times weekly. Fully equipped Cardiographic Unit. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees should be forwarded to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of RESIDENT HOUSE SURGEON, which will become vacant on or about 16th February, 1953, at the above Hospital. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited from medical practitioners for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital. The appointment will become vacant on 1st February, 1953. Salary, £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHTON, HYDE, AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited from registered medical practitioners for the following appointments :—

Ashton-under-Lyne General Hospital (800 Beds)

HOUSE SURGEON (general surgery), vacant now. Post recognised for F.R.C.S. (Eng.).

E.N.T. SURGEON (Senior House Officer grade), vacant now.

Manchester Regional Hospital Board

ORTHOPÆDIC REGISTRAR, vacant now.

Appointments are subject to Ministry of Health terms and conditions of service.

Applications, giving age, nationality, qualifications and experience, with copies of 3 testimonials, should be forwarded to R. W. MCVITY, Group Secretary.

Astley-road, Stalybridge, Cheshire.

ARLESEY, BEDS. THREE COUNTIES HOSPITAL (MENTAL). Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £700–£1000 according to experience and qualifications. The Hospital (1200 Beds) which carries out all forms of treatment and provides facilities for research work, is conveniently situated, enabling Medical Officers to attend D.P.M. and other courses in London. Some 900 patients are admitted yearly (85% voluntary). Outpatient Clinics are held at the Local General Hospitals.

Application forms are available on request to the Medical Superintendent.

AYLESBURY. TINDAL GENERAL HOSPITAL. (276 Beds.) HOUSE PHYSICIAN (Chest Unit). Second or third post. Male or Female. Vacant 1st March, 1953. Duties include care of about 20 chest cases (including T.B. chalets) which may increase in due course ; 4 Chest Clinics weekly and a Geriatric Unit. Further details on request.

Apply with 2 testimonials to Administrative Officer as soon as possible.

BEDFORD GENERAL HOSPITAL. (434 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital, whole-time, resident. Candidates may visit the Hospital by direct appointment. Post vacant 18th April, 1953.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 13th February, 1953.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. ABERDEEN ROYAL INFIRMARY AND WOODEND GENERAL HOSPITAL. Applications are invited for the temporary post of JUNIOR HOSPITAL MEDICAL OFFICER in General Surgery at the above hospitals, the appointment to be for one period of 6 months. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications, and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. Applications are invited for the resident appointment of ORTHOPÆDIC, TRAUMATIC AND CASUALTY SENIOR HOUSE OFFICER. Hospital comprises 189 Beds with large Outpatient Departments. Duties comprise service in the Orthopædic, Traumatic and Casualty Departments, and the post is recognised for F.R.C.S. Salary £670 p.a., less £155 p.a. for emoluments.

Applications, with 2 recent copy testimonials, to be forwarded to the Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BATH. ROYAL UNITED HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (pædiatrics).

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Combe Park, Bath.

BARNET GENERAL HOSPITAL, Barnet, Herts. Resident HOUSE SURGEON (general surgery). Post vacant early February. Preference will be given to persons seeking pre-registration posts under the Medical Act, 1950.

Applications, with copies of 2 recent testimonials, to be sent to the Hospital Secretary as soon as possible.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (692 Beds.) CENTRAL WIRRAL GROUP.

HOUSE OFFICER (general surgery—1 vacancy).
HOUSE OFFICER (general medicine—4 vacancies).
HOUSE OFFICER (pædiatrics—1 vacancy).

Salary in accordance with current terms and conditions of service. 6 months appointment commencing 1st April, 1953.

Application forms from Group Secretary, to be returned by 2nd February, 1953.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds.) Applications are invited from registered medical practitioners (Male and Female) for the posts of HOUSE SURGEONS (3) vacant 1st March, 1953. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country and treats 50,000 new patients each year. The posts offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant Staff: are recognised for the F.R.C.S.

Applications, accompanied by copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of a RESIDENT SENIOR HOUSE OFFICER (clinical pathology), to commence duty as soon as available. Applicants should have held resident appointments in a Children's Hospital, or a Children's Department of a general hospital, and preference will be given to those wishing to concentrate on pathology and to those with a higher qualification. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor, and should be returned not later than 14th February, 1953. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. 2 GYNÆCOLOGICAL HOUSE SURGEONS required—1 for duty with Professorial Unit. The appointment is for a period of 6 months and is recognised for the M.R.C.O.G. Duties commence 1st April, 1953.

Application forms can be obtained from the House Governor at the above address, and should be returned not later than 31st January, 1953. G. A. PHALP, Secretary,
The United Birmingham Hospitals.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (900 Beds.) HOUSE SURGEON required in the Ear and Throat Department (vacant immediately) which has 50 Beds. Post recognised for the D.L.O.

Applications, stating age, nationality, and qualifications, together with copies of recent testimonials, to the Secretary.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1098 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident. This post offers exceptional opportunities for reading for higher qualifications.

Apply to Medical Superintendent, giving details of qualifications, age and experience, with copies of 3 recent testimonials.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE SURGEON required immediately (approved pre-registration post). Appointment will be for 6 months but renewable. Hospital carries resident staff of 4 providing 2-year course of instruction which is recognised for the Diplomas of D.O. (England) and F.R.C.S. (England) in Ophthalmology. Wide experience available in all branches, including surgery.

Applications, stating age, nationality, qualifications, and experience, to Secretary, Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. SORRENTO AND LORDSWOOD MATERNITY HOSPITALS. OBSTETRIC HOUSE SURGEON. Recognised for the D.Obst.R.C.O.G. Sorrento is recognised by Birmingham University for the training of medical students in practical midwifery. Appointment becomes vacant on 1st March.

Applications could be sent to the Obstetrician, Sorrento Maternity Hospital, Birmingham, 13, not later than 28th January, 1953.

BIRMINGHAM. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT, BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER. The appointment will give broad opportunities for experience in both tuberculous and non-tuberculous thoracic surgery. The post will be paid in accordance with the appropriate salary, and is now vacant.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Secretary, Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for following whole-time appointments:—

(*a*) REGISTRAR in Psychiatry, Birmingham (Mental C) Group. Duties at Highcroft Hall, Erdington (1179 Beds). Accommodation available for single person. Experience in specialty essential and possession of higher qualification an advantage.

(*b*) REGISTRAR in Psychiatry, Shrewsbury Group. Duties at Shelton Hospital (1000 Beds), recognised for D.P.M. Opportunities for outpatient clinic work. Accommodation for single person. General hospital experience an advantage.

(*c*) REGISTRAR in E.N.T. Surgery, South Warwickshire Group. Duties at Warneford Hospital (207 Beds), Warwick Hospital (350 Beds), and Stratford Hospital (187 Beds). Non-resident appointment.

(*d*) REGISTRAR in E.N.T. Surgery, Coventry Group. Duties at Gulson Hospital (311 Beds) and Coventry and Warwickshire Hospital (346 Beds) which is recognised for F.R.C.S. and D.L.O. and has Audiometric and Hearing-aid Departments. Non-resident appointment.

(*e*) REGISTRAR in General Surgery, Dudley and Stourbridge Group. Duties at Guest Hospital, Dudley (154 Beds). Resident appointment. Experience in general surgery essential.

(*f*) REGISTRAR in Pathology, West Bromwich Group. Duties mainly at Hallam Hospital, West Bromwich (440 Beds), recognised for Diploma in Pathology. Non-resident appointment.

(*g*) REGISTRAR in Dermatology, Wolverhampton Group. Duties mainly at Royal Hospital, Wolverhampton (310 Beds) but may also include work in neighbouring group. Non-resident appointment. Experience in specialty essential.

(*h*) REGISTRAR in Orthopædics, Coventry Group. Duties at Coventry and Warwickshire Hospital (346 Beds). Single accommodation available. Experience in specialty essential. Higher qualification an advantage.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned before 9th February, 1953.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) SENIOR HOUSE OFFICER (Department of Ophthalmology). Recognised for the F.R.C.S. and D.O.M.S. This is a busy General Hospital with a large Outpatient Department, and the post offers excellent opportunities for experience under a Consultant Ophthalmologist. Salary and conditions of service in accordance with national scale.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

WALTER R. SMITH, Group Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) HOUSE PHYSICIAN (resident), vacant 1st February, 1953. This is a busy General Hospital with a large Outpatient Department and the post offers excellent opportunities for general experience under Consultant Physicians. Pre-registration post under Medical Act 1950. Salary and conditions of service in accordance with national scale.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) RESIDENT HOUSE SURGEON (Surgical Department). This post is recognised by the Royal College of Surgeons as a qualifying appointment for the Final examination. This is a busy General Hospital with a large Outpatient Department and the post offers excellent opportunities for general experience under Consultant Surgeons. Pre-registration post under Medical Act, 1950. Salary and conditions of service in accordance with national scale.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (550 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. The successful candidate may occasionally be called upon to give anæsthetics in other hospitals in the Group. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL (550 Beds), AND ESSEX COUNTY HOSPITAL, COLCHESTER, ESSEX (192 Beds). Applications invited for post of HOUSE SURGEON (first, second, or third post); tenable for 6 months. Duties to include work in general surgical and gynæcological wards. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a. Recognised under F.R.C.S. regulations.

Applications, with copies of 3 recent testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (550 Beds.) Applications invited for post of HOUSE PHYSICIAN (first, second or third post) in the medical and pædiatric wards of the above Hospital. Tenable for 6 months from 4th March. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (surgical), first or second post held. Salary £350–£400 p.a., plus special grant of £50 p.a., less £100 p.a. for residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent, as soon as possible, to the Administrative Officer.

BISHOP AUCKLAND GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (obstetrics and gynæcology) available 1st March; departmental beddage 66; Hospital recognised for D.Obst.R.C.O.G. Salary £350–£450 p.a., according to previous posts held, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, to be sent with names of 2 referees, to the undersigned as soon as possible.

K. G. T. LUXFORD, Secretary/Finance Officer.

General Hospital, Bishop Auckland.

BLACKBURN. ROYAL INFIRMARY. (244 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required for duties mainly at the Royal Infirmary. Post recognised for F.R.C.S. National Health Service salary and conditions of service.

Applications should be sent to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (244 Beds.) HOUSE SURGEON required to take up duty 14th February, 1953. Approved pre-registration post and recognised for F.R.C.S. National Health Service salary and conditions of service.

Applications should be sent to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. QUEEN'S PARK HOSPITAL. (650 Beds.) MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology with duties mainly at Queen's Park Hospital (58 obstetric and 27 gynæcological beds) recognised for D.Obst.R.C.O.G. and M.R.C.O.G. The appointment is for 1 year from 1st March, 1953, in the first instance and the successful candidate would be required to undertake occasional duties in other hospitals and maternity homes of the Group.

Applications on forms to be obtained from, and returned to, the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKBURN. QUEEN'S PARK HOSPITAL. MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the resident post of REGISTRAR in General Surgery for duties in the Blackburn and District Group. The successful candidate will be based at Queen's Park Hospital, which is a mixed General Hospital recognised for F.R.C.S. The post is now vacant and will be tenable for 1 year in the first instance. National Health Service salary and conditions of service apply.

Application forms should be obtained from, and returned to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Senior House Officer grade), vacant immediately and tenable for 12 months. The successful candidate will be required to reside at the Hulton Hospital (144 Beds) and the duties will include responsibility for infectious diseases and dermatological cases at the hospital, together with a small number of general surgery cases, and may include medical outpatients and inpatients experience in the general hospitals of the group. Previous pædiatric experience would be an advantage but is not essential. Married quarters may be provided by arrangement, if required, at an agreed charge.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Group Secretary.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

The Royal Infirmary, Bolton (237 Beds)

RESIDENT REGISTRAR in General Surgery (Resident Surgical Officer). Recognised for F.R.C.S., vacant immediately.

Bolton District General Hospital (521 Beds)

RESIDENT PATHOLOGIST (Senior House Officer grade), vacant immediately, tenable for 12 months.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Group Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) Applications are invited for the following vacancies:—

RESIDENT HOUSE SURGEONS.

(1) General surgical duties.
(2) General Surgical and Gynæcological Units.
(3) Casualty and Orthopædic Departments.

All posts offer excellent experience.

Applications, giving full details of age, qualifications, experience, together with testimonials or names for reference, should be addressed to J. E. SMITH, Group Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) RESIDENT SURGICAL OFFICER (Senior House Officer grading). Post now vacant. The Hospital is recognised for examination purposes by the Royal College of Surgeons and affords a first-class opportunity of gaining general experience in a busy Acute Surgical Unit.

Applications, giving full details of age, qualifications, experience, together with testimonials or names for reference, should be addressed to J. E. SMITH, Group Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ANÆSTHETIST (Senior House Officer) required immediately. The post is recognised for the D.A. and is tenable for 12 months. Salary £670 p.a.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH, HANTS. CHRISTCHURCH HOSPITAL. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for 2 HOUSE PHYSICIAN appointments becoming vacant in January and February, 1953. There are 60 acute medical beds, 196 semi-acute and chronic sick beds and 34 pædiatric beds. The successful applicants will have to assist in the Outpatient Department at the Royal Victoria Hospital, Bournemouth.

Applications to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Bournemouth.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital

SENIOR HOUSE OFFICER (orthopædics).

Applications are invited for the above post and should indicate age, nationality, qualifications, and experience, and should be sent to the undersigned as soon as possible.

RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) with duties mainly at Bury General Hospital. The post, tenable for 1 year, affords opportunities for gaining experience in all branches of pathology. Salary and conditions of service as Ministry of Health scale.

Applications, stating nationality, age, qualifications, and experience, along with names of 2 referees, should be forwarded immediately to the undersigned at Bury General Hospital, Walmersley-road, Bury, Lancs.

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) Applications are invited for the post of HOUSE SURGEON for casualty and orthopædic duties. Post is recognised for F.R.C.S.

Full details to the Hospital Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant 1st March. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.

HOUSE SURGEON or SENIOR HOUSE SURGEON (general and urology), vacant 1st March, 1953. Salary £350–£450 p.a., less £100 p.a. residential emoluments, or £670 p.a., less £130 p.a. residential emoluments.

Locum HOUSE SURGEON (general and urology), 1st–30th April. Salary £8 p.w., less residential emoluments at rate £100 p.a.

Applications for above posts, stating age, nationality, qualifications and experience with copy testimonials, to Secretary.

BRENTWOOD MENTAL HOSPITAL, Brentwood, Essex. Temporary PSYCHIATRIC REGISTRAR required. The Hospital is situated within easy reach of London by main line electric service and bus. There are over 2000 beds and a wide experience of all types of mental disorders (including the neuroses) can be obtained. All modern treatments are carried out, including psychosurgery. Visiting Consultants in other specialties attend regularly. Teaching by senior staff and facilities for attending postgraduate courses are provided; also experience of outpatient clinics. Regular clinical meetings are held. The successful applicant will work under the direction of a Consultant Psychiatrist. Library, private bed-room and individual sitting-room are provided. Indoor and outdoor recreational facilities. The post may be non-resident. Salary at the rate of £775 p.a., less a reasonable charge for residential emoluments.

Applications, stating age, experience, and qualifications, should be sent to the Physician-Superintendent, with the names of 2 referees.

BROMSGROVE. ALL SAINTS HOSPITAL. Mid-WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE.

HOUSE OFFICER (obstetrical and gynæcological).

HOUSE PHYSICIAN.

Posts now vacant in this Hospital of 468 Beds.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROXBURN, WEST LOTHIAN. BANGOUR HOSPITAL. TUBERCULOSIS UNIT. Applications are invited for appointments as HOUSE OFFICERS in the Tuberculosis Unit at Bangour Hospital, Broxburn, which is 15 miles from Edinburgh. The Unit contains 200 Beds for treatment of all forms of tuberculosis including meningitis. Thoracic and orthopædic surgery. Salary and conditions of service will be in accordance with the regulations.

Applications, giving age, qualifications, and particulars of previous experience, should be lodged with the Medical Superintendent, Bangour Hospital.

BRISTOL. COSSHAM FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. (499 staffed beds, expanding.) HOUSE SURGEON (General Surgery Wards), pre-registration post, vacant 1st February, 1953.

Applications, with full particulars, should be addressed to the Group Secretary, Frenchay Hospital, quoting G.S.F.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (499 staffed beds.) RESIDENT SENIOR HOUSE OFFICER in the Department of Plastic and Jaw Surgery.

Applications, with full particulars, to the Group Secretary, Frenchay Hospital, Bristol.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (499 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Regional Neurosurgery Department. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." 2 referees required.

BRIGHTON GENERAL HOSPITAL. House Surgeon (recognised for F.R.C.S.), at General Surgical Unit (60 Beds), vacant 28th February, 1953.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. CASUALTY HOUSE SURGEON required (1 of 2—attached to the Orthopædic and Traumatic Unit), now vacant.

Applications, giving details of qualifications, age, and experience, together with the names and addresses of 2 referees, to be sent to the Administrative Officer as soon as possible.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS for duties in the E.N.T. Department of the Group hospitals (78 Beds), vacant now. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., and names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, as soon as possible.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Resident ANÆSTHETIC HOUSE OFFICER for 6 months. Recognised pre-registration service.

Apply, stating age, nationality, qualifications and experience, with dates, and copies of 3 testimonials to Secretary by 30th January.

CAMBRIDGE. FULBOURN MENTAL HOSPITAL. (900 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Psychiatry. Full range of modern treatment and outpatient clinics. Facilities for study for D.P.M. Single quarters available. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th February, 1953. Candidates invited to visit the Hospital by arrangement with the Medical Superintendent.

CAMBRIDGE. FULBOURN HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER at the above Hospital. This Hospital (it is linked with the University and its Teaching Hospital) is progressive and has a large annual admission-rate, mainly voluntary patients. All forms of modern treatment are given. There are 4 associated outpatient clinics. Facilities exist for D.P.M.

Applications with names of 2 referees to be sent to the Medical Superintendent immediately.

CAMBORNE. TEHIDY HOSPITAL. (189 Beds.) West CORNWALL HOSPITAL MANAGEMENT COMMITTEE. There is a vacancy for a RESIDENT HOSPITAL OFFICER for which applications are invited from registered medical practitioners. Practitioners convalescent from tuberculosis will be favourably considered. This is an appointment which offers good scope in this branch of medicine.

Applications, together with copies of 2 recent testimonials, should be addressed to the Hospital Secretary, Tehidy Hospital, Camborne.

CATERHAM, SURREY. ST. LAWRENCE'S (Mental Deficiency) HOSPITAL. (2256 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (temporary, for at least 5–6 months) required. Salary scale £700–£50–£1000 p.a.; charge of £165 p.a. if resident. The Hospital is near London; opportunities for further study.

Applications, stating age, qualifications, and experience, together with names of 2 referees, to reach the Physician-Superintendent by 3rd February, 1953.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (265 Beds.) E.N.T. AND EYE HOUSE SURGEON. The above post, which is recognised for the D.L.O. and D.O.M.S. examinations, is now vacant. National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (265 Beds). GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON. The above pre-registration post, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CHESTER (near). MEADOWSLEA HOSPITAL. WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident). Salary £700–£1000 p.a., less recognised charge for services provided by Hospital. The appointed candidate will be a member of a chest team covering a wide area in North Wales with excellent opportunities for experience in hospital and chest clinic practice. A flat is available for the successful candidate.

Applications, stating age, qualifications, experience, together with the names of 3 referees, to the Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, within 14 days.

CHESTER. BARROWMORE HOSPITAL, Great Barrow, CHESTER. (205 Beds.) SENIOR HOUSE OFFICER (Male). Post vacant immediately. Salary £670, subject to deduction of £100 p.a. for residence. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit.

Apply immediately, sending 2 references or names of referees, to Secretary.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (832 Beds.) ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE SURGEON (Senior House Officer) to 1 of the 2 General Surgical Units comprising 70 Beds. Vacant now.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) Whole-time REGISTRAR required for surgical and orthopædic duties. Applicants are invited to visit the Hospital (which is within easy reach of central London) by appointment.

Applications, on forms obtainable from the Group Secretary, Queen Mary's Hospital for Children, Carshalton, Surrey, should be submitted by 7th February, 1953.

CARLISLE. CUMBERLAND INFIRMARY. (340 Beds.) Applications are invited for the resident post of HOUSE OFFICER (orthopædic and fracture) for the 6 months commencing immediately.

Applications, giving the names of 2 referees, should be sent to the undersigned as soon as possible.

A. PICKERING, Group Secretary,
East Cumberland Hospital Management Committee.
Cumberland Infirmary, Carlisle.

CARLISLE. CUMBERLAND INFIRMARY. (340 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery). The appointment is for a period of 1 year.

Applications, giving the names of 2 referees, should be sent to the undersigned as soon as possible.

A. PICKERING, Secretary.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of SENIOR MEDICAL REGISTRAR.

Application forms can be obtained from the Secretary and Principal Administrative Officer, The United Cardiff Hospitals, Cardiff Royal Infirmary.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of MEDICAL REGISTRAR.

Application forms can be obtained from the Secretary and Principal Administrative Officer, The United Cardiff Hospitals, Cardiff Royal Infirmary.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of REGISTRAR in the Department of Dermatology.

Application forms can be obtained from the Secretary and Principal Administrative Officer, The United Cardiff Hospitals, Cardiff Royal Infirmary.

CHELMSFORD AND ESSEX HOSPITAL, London-road, CHELMSFORD. (163 Beds.) Applications are invited for the post of HOUSE PHYSICIAN to work in the General Medical Wards of the above Hospital. Duties will commence on 14th February.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Chelmsford Group Hospital Management Committee, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (Late Botleys Park War Hospital—430 Beds.) Required, SENIOR HOUSE OFFICER for the Gynæcological and Special (E.N.T., Eyes, &c.) Departments. Salary in accordance with terms and conditions of National Health Service. Hospital within easy reach of London.

Applications, together with testimonials or names of referees, should be sent to the Physician-Superintendent, quoting reference L.T., St. Peter's Hospital, as soon as possible.

CHICHESTER (near). ALDINGBOURNE HOUSE SANATORIUM (71 Beds) AND BOGNOR REGIS ANNEXE (49 Beds). HOUSE PHYSICIAN (Male or Female) required immediately; liaison with Thoracic Unit, Chichester. Resident at Bognor Regis.

Apply to Physician-Superintendent, Aldingbourne House Sanatorium, near Chichester.

COLCHESTER. SEVERALLS HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £670 p.a., less £120 for residential emoluments. There are excellent opportunities for up-to-date experience and postgraduate work in all branches of psychiatry, including treatment of neurosis. Opportunities will be given at the Hospital for clinical instruction for the D.P.M.

Applications, with particulars and copies of testimonials, or names of referees, to the Medical Superintendent, Severalls Hospital, Colchester, as soon as possible.

COLCHESTER. SEVERALLS HOSPITAL. (2027 Beds.) REGISTRAR (psychiatry). Temporary appointment of 6 months. Salary and conditions of service for hospital medical and dental staffs will apply. The Hospital provides a full range of psychiatric treatment and there are associated outpatient clinics. Resident quarters for single person.

Apply to Medical Superintendent as soon as possible.

CROYDON. MAYDAY HOSPITAL. (637 Beds.) Locum MEDICAL REGISTRAR (whole-time), from 2nd to 15th February. Previous experience in general medicine essential. Higher qualification an advantage.

Apply, giving particulars of age, qualifications, and experience, to— GEORGE A. PAINES, Secretary,
Croydon Group Hospital Management Committee.
General Hospital, Croydon.

CHELTENHAM. SUNNYSIDE MATERNITY HOSPITAL. CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT OBSTETRIC OFFICER. The Hospital, which is recognised for the purpose of training for the D.Obst.R.C.O.G., has 63 Beds and deals with the majority of abnormal midwifery cases in North Gloucestershire. The appointment is for a period of 6 months and the salary will be £400 or £450 p.a., less £100 in respect of residential emoluments. The appointment will be vacant at the end of February.

Applications, stating age, qualifications and experience, and accompanied by copies of 3 recent testimonials, should be sent to the Secretary, Cheltenham Group Hospital Management Committee, General Hospital, Cheltenham.

CHESTERFIELD ROYAL HOSPITAL. Resident Anæsthetist (Senior House Officer grade) required at above Hospital immediately, for 1 year. Post recognised for D.A. Salary £670 p.a., less £155 yearly for board, lodging, &c.

Apply, with names of 2 referees, to—
M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. Pre-registration HOUSE OFFICER or SENIOR HOUSE OFFICER required immediately. National salary and conditions.

Applications to— M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

COVENTRY AND WARWICKSHIRE HOSPITAL, COVENTRY. (346 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required in Ophthalmic Department (36 Beds and very large Outpatient Department, including optical dispensing service). Hospital recognised for D.O. Previous experience desirable.

Applications to the Group Secretary, Group 20 Hospital Management Committee, Coventry and Warwickshire Hospital, Coventry.

COTTINGHAM, E. YORKSHIRE. CASTLE HILL SANATORIUM. (221 Beds.) Urgently required, Locum Tenens SENIOR HOUSE OFFICER or HOUSE OFFICER for above Sanatorium, £13 per week or £8 per week respectively. Associated with Group Sanatoria, Major Thoracic Surgery Unit, and Mass Miniature Radiography Unit.

Applications to Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, E. Yorkshire.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE.
HOUSE SURGEON (general).
HOUSE OFFICER (E.N.T. and ophthalmology), vacant 1st February, 1953.
HOUSE OFFICER (chest diseases), vacant 30th January, 1953.

Applications, stating age, qualifications, experience, nationality, and the names of 2 persons to whom reference may be made, to be sent to the Group Secretary, Dartford Hospital Management Committee, The Bow Arrow Hospital, Dartford, Kent.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the posts of HOUSE PHYSICIAN and HOUSE SURGEON at this busy Hospital. The posts become vacant at the end of January, 1953, and February, 1953, respectively, and offer varied experience in pleasant surroundings. 4 residents on the staff and salary at the rate of £350, £400 and £450 a year according to experience. A deduction of £100 a year for residential emoluments. The appointments are tenable for 6 months in first instance.

Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited from registered medical practitioners with previous hospital experience, preferably at a Teaching Hospital, for the post of SENIOR HOUSE SURGEON (Senior of 4) at this busy General Hospital. The post, which becomes vacant on 11th February, 1953, is suitable for candidate seeking further clinical experience and opportunity for reading for higher qualification. Salary £670 p.a., with a deduction of £100 p.a. for board, lodging, &c., if resident.

Applications, giving all relevant particulars, with copies of 2 recent testimonials or names and addresses of 2 referees, should be forwarded to the Secretary, Noble's Isle of Man Hospital, Douglas.

DOVERCOURT, ESSEX. HARWICH AND DISTRICT HOSPITAL. (30 Beds.) Applications invited for appointment of SENIOR HOUSE OFFICER (Resident Surgical Officer). Tenable for period of 1 year from 1st February. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DOVER, KENT. BUCKLAND HOSPITAL. Applications are invited for the post which is now vacant of HOUSE PHYSICIAN at the above Hospital. Duties include some pædiatrics. Salary £350, £400 or £450 a year according to experience, less a deduction of £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited for the post which is now vacant of JUNIOR HOUSE SURGEON at the above Hospital. Salary £350, or £400 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration), vacant 1st April, 1953.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical), vacancy occurs 1st March, 1953, only if no applicants are forthcoming for a pre-registration post.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (Orthopædic and Fracture Service), vacant immediately.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent as soon as possible to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of HOUSE OFFICER (ophthalmic), vacant immediately. Recognised for F.R.C.S.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent as soon as possible to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical), vacancy occurs 1st April, 1953, only if no applicants are forthcoming for a pre-registration post.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (pre-registration), vacant 1st March, 1953.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Secretary, Derbyshire Royal Infirmary, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (orthopædics) to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th February, 1953.

DERBY, KINGSWAY HOSPITAL. Sheffield Regional HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital (730 Beds). Salary scale £700–£50–£1000 p.a. Residential accommodation available for a single person. The Hospital is situated near the town, has modern admission units, and all forms of psychiatric treatment are undertaken.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, to be forwarded to the Group Secretary at Kingsway Hospital, Derby.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. SENIOR SURGICAL CASUALTY HOUSE OFFICER (resident) required. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Post vacant 1st March, 1953.

Applications, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, not later than 7th February, 1953.

EASTBOURNE. ST. MARY'S HOSPITAL. (261 Beds.) Applications are invited for the post of GYNÆCOLOGICAL HOUSE SURGEON (28 Beds) with duties in abnormal Obstetric Unit. Staff of 5 House Officers.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, to the Secretary, 29, Bedfordwell-road, Eastbourne.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR, East Suffolk and Ipswich Hospital (360 Beds) and Ipswich Borough General Hospital (300 Beds). Post provides wide experience in general medicine. Single quarters are available at the Ipswich Borough General Hospital. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th February, 1953. Candidates invited to visit the hospitals by direct arrangement with the Hospital Management Committee Secretary, East Suffolk and Ipswich Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR at Foxhall Hospital, Ipswich (formerly Ipswich Sanatorium), 120 Beds. Duties include work in the Thoracic Surgical Unit and in the Ipswich Chest Clinic. A flat is available. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th February, 1953. The Hospital may be visited by arrangement with Hospital Management Committee Secretary, East Suffolk and Ipswich Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR at the North Cambridgeshire and Clarkson Hospitals, Wisbech (249 Beds). Post provides experience in general medicine and paediatrics and facilities for study. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th February, 1953. Hospitals may be visited by arrangement with the Hospital Management Committee Secretary, at the Memorial Hospital, Peterborough.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. UNITED CAMBRIDGE HOSPITALS. REGISTRAR in Psychiatry at Fulbourn Mental Hospital and Psychiatric Department, Addenbrooke's Hospital, Cambridge. This is a trainee post which provides full facilities for clinical work and study for D.P.M. Appointment for 1 year, renewable for second year.

Detailed applications, including age and the names of 3 referees, to Secretary, East Anglian Regional Hospital Board, 117, Chesterton-road, Cambridge, by 9th February, 1953. Candidates invited to visit hospitals by arrangement with the Medical Superintendent of Fulbourn Hospital, Cambridge.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds— 82 general medical beds.) Applications are invited for the post of HOUSE PHYSICIAN to fill a vacancy arising on approximately 20th February, 1953. Busy general hospital with easy access to London. Salary on national scale, less a deduction at the rate of £100 p.a. for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 30th January, 1953.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds— 85 general surgical beds, including E.N.T., Oral and Faciomaxillary Unit.) Applications are invited for the appointment of HOUSE SURGEON for general surgery, including duties in E.N.T. and Eye Department, to fill vacancy arising on 20th February, 1953. Busy general hospital with easy access to London. Salary on national scale, less a deduction at the rate of £100 p.a., for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, by 30th January, 1953.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (second or third post) required 17th February, 1953, for general surgical duties. Post, which is tenable for 6 months, is recognised for the F.R.C.S. R practitioners holding first posts may apply.

Applications, stating age, nationality, qualifications, and experience, with the names of 2 referees, to the Secretary of the Management Committee by 31st January, 1953.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT PATHOLOGIST (Senior House Officer grade) required, in the Group Laboratory. Vacant now. General pathological duties. 12 months appointment.

Applications, stating age, qualifications, experience, nationality, and the names of 2 referees, to the Secretary of the Management Committee at Chase Farm Hospital immediately.

EXETER (near). EXMINSTER HOSPITAL. Devon MENTAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER. National scale, less a deduction for residential emoluments.

Applications, stating age, qualifications, experience, names of 3 referees, to Medical Superintendent, Exminster Hospital, near Exeter.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the post of CASUALTY OFFICER and to act as House Surgeon to the E.N.T. Department, with alternate week-ends on duty for the Obstetric and Gynæcological Department. Vacant 16th February, 1953. The appointment is for a period of 6 months.

Applications, with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary by 31st January, 1953.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following recognised pre-registration posts :—

HOUSE SURGEON, vacant 11th February, 1953.
HOUSE SURGEON, vacant 18th February, 1953.

Applications, with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary by 31st January, 1953.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. (320 Beds—10 Resident Medical staff employed.) EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER in Clinical Pathology (resident). Salary £670 p.a., less deduction of £100 p.a. for residential emoluments. The appointment is for a period of 12 months, and the successful applicant will be responsible for emergency pathological and blood transfusion duties, and will work, under the supervision of the Area Pathologist, in different branches of clinical pathology (Health Service terms and conditions). Vacant 14th February, 1953.

Applications, together wtih copies of 2 recent testimonials, to the Hospital Secretary on or before 31st January, 1953.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post, vacant 10th February, 1953 (and recognised for the D.L.O.), of SENIOR HOUSE OFFICER, with duties in Surgical and E.N.T. Departments.

Applications, with names of 2 referees, to Hospital Secretary, Grimsby General Hospital.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the appointment of SURGICAL HOUSE OFFICER at the above Hospital, which is now vacant. Salary £350, £400, or £450 a year according to experience, less a deduction of £100 a year for residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Medicine.

Write not later than 5th February, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Orthopædics.

Write giving 3 names for reference to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GRANGE-OVER-SANDS. WESTMORLAND SANATORIUM, MEATHOP, GRANGE-OVER-SANDS. Applications are invited from registered medical practitioners for the appointment of HOUSE OFFICER (resident) up to Junior Hospital Medical Officer grade according to experience. The Sanatorium contains 160 Beds (male and female).

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Secretary of the Lancaster and Kendal Hospital Management Committee, Royal Lancaster Infirmary, Lancaster.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. 2 vacancies at the above Hospital for HOUSE SURGEONS (Male or Female). The Hospital is staffed by a Consultant General Surgeon, and a Consultant E.N.T. Surgeon and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital, Norwich. Salary in both cases £350, £400, or £450 according to experience, less £100 for residential emoluments.

Applications, stating age, qualifications, experience, with names of 2 referees, to Secretary of Hospital.

GUILDFORD. ST. LUKE'S HOSPITAL. Guildford Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE SURGEON in the General Surgical Unit (66 Beds). The post is recognised for the F.R.C.S. and falls vacant 22nd February, 1953.

Applications, with copies of 3 testimonials, should be forwarded to the Physician-Superintendent as soon as possible.

HALIFAX AREA HOSPITALS MANAGEMENT COMMITTEE. 2 SENIOR HOUSE OFFICERS required in the Anæsthetic Departments at Royal Halifax Infirmary (301 Beds) and Halifax General Hospital (425 Beds); both busy acute general hospitals. Opportunities for studying for D.A. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, to be forwarded to Group Secretary, Royal Halifax Infirmary, Halifax, Yorkshire.

HEREFORD. COUNTY HOSPITAL. (333 Beds.) Herefordshire HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for appointment of HOUSE OFFICER (general surgery), vacant as from 6th March, 1953. Conditions of Service applicable to hospital medical and dental staffs (England and Wales).

Applications, with copies of 2 recent testimonials, should be sent to the Medical Superintendent, County Hospital, Hereford.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of HOUSE SURGEON (Male or Female), second post, for general surgery. R practitioners holding first post may apply. 6 months appointment. Salary at rate of £400 p.a., less £100 p.a. for residential emoluments. Duties to commence 8th February, 1953.

Applications to Group Secretary, Hertford Group Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary REGISTRAR (surgical) at the above Hospital. Appointment to commence immediately with tenure up to 6 months. Salary at the rate of £775 p.a., non-resident.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) CASUALTY HOUSE OFFICER (Male or Female), first, second, or third post held, with attachment to Pædiatrician and Ophthalmic Consultant. Salary £350–£450 p.a., less £100 p.a. residential emoluments. Appointment to commence immediately.

Applications, with full details and references, to Secretary, County Hospital, Hertford, Herts.

HITCHIN HOSPITALS, Hitchin, Herts. Applications are invited for the post of RESIDENT HOUSE SURGEON at the North Herts and South Beds Hospital, now vacant. Preference will be given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, should be sent to the Medical Director, The Lister Hospital, Hitchin, Herts.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) SENIOR HOUSE OFFICER required for Urology and Children's Surgery; post vacant now, is recognised for F.R.C.S., may be tenable for 6 or 12 months. National scale of salary.

Apply to Hospital Administrator.

HARROW CHEST CLINIC, 199, Station-road, Harrow, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR required at above Clinic. Good training in general medicine essential and some experience in chest diseases desirable. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 3rd February, 1953.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (162 Beds—recognised by Royal College of Surgeons.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, £450 p.a., according to experience, less £100 p.a. for board and residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE OFFICER (medical). Salary £350, £400, £450 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEXHAM GENERAL HOSPITAL. (317 Beds.) Hexham AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Vacancies will occur shortly for a HOUSE SURGEON (orthopædics and casualties) and a HOUSE SURGEON (general surgery). Salary in each case £350–£400–£450, according to experience, less £100 for residential emoluments. The Hospital is recognised by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, should be sent as soon as possible to—

W. STOKELL, Group Secretary.

General Hospital, Hexham, Northumberland.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in Ophthalmology (non-resident), to commence duties immediately. The post is recognised for the Diploma in Ophthalmology. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, should be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty on 28th January, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required to commence duty on 21st February, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (262 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital, to commence duties on 16th March, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs—£700–£50–£1000.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary,

Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

HAYWARDS HEATH (near), SUSSEX. CUCKFIELD HOSPITAL. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER for Maternity Unit of 51 Beds and gynæcological ward. The post becomes vacant on 16th February, 1953. National salary scale and conditions of service.

Applications, stating age, qualifications and experience, accompanied by copies of 2 recent testimonials, should be sent to the Deputy Group Secretary, Mid-Sussex Hospital Management Committee, Cuckfield Hospital, Cuckfield, near Haywards Heath, Sussex.

HUNTINGDON COUNTY HOSPITAL. The Hospital is approved by the licensing authority for pre-registration service and applications are invited for the post of JUNIOR HOUSE OFFICER (medical). The selected candidate will be required to look after medical and pædiatric cases and may be called upon to give emergency anæsthetics.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee, Newmarket General Hospital, Newmarket.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. RAIGMORE HOSPITAL. HOUSE SURGEON required for 6 months from 1st February, 1953. Post recognised for pre-registration training.

Applications, with references, to Medical Superintendent.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. RAIGMORE HOSPITAL. ORTHOPÆDIC HOUSE SURGEON (Orthopædic Department—140 Beds) required for 6 months from 1st February, 1953. Post recognised for pre-registration training.

Applications, with references, to Medical Superintendent.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for Orthopædic Unit. Post recognised for F.R.C.S. Resident, full-time. Preference will be given to pre-registration candidates.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 3rd February, 1953.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER required for Geriatric Unit. Resident, full-time.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 3rd February, 1953.

ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS.

St. Mary's Hospital, Newport, I.W., vacant now.

Royal I.W. County Hospital, Ryde, vacant 21st February, 1953.

Posts approved for pre-registration service.

Applications to Chief Administrative Officer, Clatterford House, Carisbrooke, I.W.

KETTERING GENERAL HOSPITAL. (166 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (Anæsthetist), resident, which becomes vacant on 1st February. The appointment is tenable for 1 year in the first instance. Salary in accordance with Ministry of Health terms and conditions of service. The Hospital is recognised for training for the Diploma in Anæsthetics.

Applications, together with copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering General Hospital, immediately.

KETTERING GENERAL HOSPITAL. (166 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE OFFICER in Traumatic, Orthopædic and Casualty work, to commence on 14th February, 1953, for a period of either 6 or 12 months. There are 5 House Officers and full Consultant staff. Salary, &c., in accordance with national scale.

Applications, giving age, nationality, qualifications, any previous experience, and copies of 2 recent testimonials, should be sent as soon as possible to the Group Secretary, General Hospital, Kettering.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of HOUSE OFFICER (general medicine), resident. The post is vacant on 1st April, 1953.

Applications, stating age, experience, and accompanied by 2 recent testimonials or names of referees, should be sent to the Physician-Superintendent of the Hospital as soon as possible.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) Applications are invited for the appointment of RESIDENT HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative clinics. The post is vacant now and normally tenable for 6 months.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary.

LEICESTER GENERAL HOSPITAL AND ROYAL INFIRMARY, SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the whole-time post of REGISTRAR (orthopædics) to the above hospitals which are recognised for the F.R.C.S. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 2nd February, 1953.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (Casualty Department), immediate vacancy. The post gives opportunity for study for Final examination for Fellowship.

Applications, with copies of 3 testimonials, forthwith, to Secretary, Leicester No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEICESTER ROYAL INFIRMARY. Leicester Regional CENTRE FOR RADIOTHERAPY. Applications are invited for the resident post of SENIOR HOUSE OFFICER (radiotherapy) or REGISTRAR if in possession of Part I of the D.M.R.T., vacant 1st February.

Candidates should state age, nationality, qualifications and submit copies of 3 recent testimonials, to Secretary, Leicester No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT NEUROSURGICAL OFFICER at the General Infirmary at Leeds. The appointment is in the Registrar grade and will be resident. The post offers excellent opportunity for training in this specialty. Previous experience desirable but not essential.

Applications, stating age, qualifications, and previous posts with dates, together with the names of 3 referees, to be forwarded to the Medical Secretary, Joint Registrars Committee, School of Medicine, Leeds, 2, not later than 10th February, 1953.

LEEDS. CHAPEL ALLERTON HOSPITAL. Ministry of PENSIONS. (340 Beds.) The post of SENIOR HOUSE OFFICER (medical) which provides practical experience in internal medicine is now vacant. Salary £670 p.a., with a deduction of £130 for residential emoluments.

An application form will be provided on request to the Director-General of Medical Services (M.S.2), Ministry of Pensions, Norcross, Blackpool, Lancs.

LEEDS. CHAPEL ALLERTON HOSPITAL. Ministry of PENSIONS. (340 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) which provides experience in general and orthopædic surgery and in the rehabilitation of the limbless. Salary £670 p.a., with a deduction of £130 for residential emoluments.

An application form will be provided on request to the Director-General of Medical Services (M.S.2), Ministry of Pensions, Norcross, Blackpool, Lancs.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

(*a*) Hull A Group with additional duties at hospitals in Hull B and East Riding Groups (non-resident).

(*b*) Huddersfield Group (resident or non-resident).

Chest Diseases

(*a*) Middleton Hospital, near Ilkley (400 Beds). There are good surgical and radiological facilities and both pulmonary and non-pulmonary cases are treated. Residential accommodation is available for a single person.

(*b*) For initial duties with the Mass Radiography Service in Bradford with sessions at the Bradford Chest Clinic under the immediate supervision of the Senior Chest Physician in the area. After a satisfactory term in mass radiography the selected candidate will be considered for a further period of training in selected Regional Sanatoria.

(*c*) Scotton Banks Sanatorium, Knaresborough (resident).

(*d*) Castle Hill Sanatorium, Cottingham, E. Yorks (non-resident).

General Medicine

Rheumatism Centre, Harrogate, and the Rheumatism Clinic at Leeds General Infirmary (non-resident). This appointment offers considerable scope for experience in rheumatic diseases.

General Surgery

Pontefract and Castleford Group (resident—married accommodation available).

Infectious Diseases

Leeds Road Hospital, Bradford (resident).

Obstetrics and Gynæcology

Halifax Group (resident). Recognised for M.R.C.O.G. Appointment will be vacant on 1st April, 1953, or probably earlier.

Orthopædic Surgery

(*a*) Pontefract and Castleford Group (resident).

(*b*) General Hospital, Batley, and other hospitals in the Dewsbury, Batley, and Mirfield Group (resident).

(*c*) Marguerite Hepton Memorial Orthopædic Hospital, Thorp Arch, near Wetherby (75 long-stay children's beds). A 3-bedroomed, partly furnished house in available in the Hospital grounds. Appointment to commence on 1st April, 1953.

Otolaryngology

(*a*) Huddersfield and Halifax Groups. Appointment is non-resident but successful candidate will be required to reside in Huddersfield.

(*b*) Hull Royal Infirmary and associated hospitals (non-resident).

Both Departments are recognised for the Fellowship and the D.L.O.

Pathology

St. James's Hospital, Leeds, and the Regional Blood Transfusion Centre, Seacroft, Leeds (non-resident). This joint post will give considerable opportunity for experience in all branches of pathology especially hæmatology.

Psychiatry

(*a*) Stanley Royd Hospital, Wakefield (2000 Beds). Residential accommodation is available for a single person.

(*b*) De la Pole Hospital, Willerby, E. Yorks (1000 Beds), and associated clinics (resident or non-resident). Accommodation available for a single person or a married person without children.

(*c*) St. James's (General) Hospital Psychiatric Unit, Leeds. This post is resident and offers special opportunity for experience with neurotic and psychosomatic patients.

Facilities for study for the D.P.M. at Leeds University will be given to persons appointed to the above posts.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 31st January, 1953.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (985 Beds, 123 Cots.) SOUTH LIVERPOOL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st April, 1953, and will be for a period of 6 months. These posts are approved as pre-registration posts.

5 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
2 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health, the salary being at the rate of £350 p.a. for the first post held, £400 p.a. for the second post held, and £450 p.a. for the third and any subsequent post held. A deduction at the rate of £100 p.a. will be made in respect of board, lodging, and other services provided.

Application forms may be obtained from the undersigned to whom they should be returned not later than Monday, 2nd February, 1953.

GARNET CHAPLIN, Secretary to the Committee.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. THE WOMEN'S HOSPITAL. Applications are invited for a temporary post as SENIOR HOUSE OFFICER (gynæcological) for the period from 1st April to 30th September, 1953.

Apply by 14th February, 1953, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. EAR, NOSE AND THROAT INFIRMARY. (93 Beds.) Applications are invited for a temporary post as REGISTRAR (E.N.T.) for the period to 30th September, 1953.

Apply by 14th February, 1953, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ST. PAUL'S EYE HOSPITAL. (116 Beds.) Applications are invited for a temporary post as SENIOR HOUSE OFFICER (ophthalmology) for the period to 30th September, 1953.

Applications on forms obtainable from the undersigned should be returned as soon as possible.

A. V. J. HINDS, Secretary,
The United Liverpool Hospitals.

80, Rodney-street, Liverpool, 1.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Lincoln NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery (resident). Post recognised for F.R.C.S. Terms and conditions of service in accordance with those laid down for hospital medical and dental staffs.

Applications, together with copies of 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

R. W. HOWICK, Group Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) Applications are invited for the post of HOUSE OFFICER (obstretrics, gynæcology and some other duties) which is now vacant at this busy General Hospital. A deduction of £100 p.a. will be made for residential emoluments.

Applications, giving full particulars, together with names of 2 referees, to be addressed to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited, for the appointment of HOUSE SURGEON for Accident Service and Casualty. The post will be for 6 months in the first instance, and is now vacant.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, should be sent to the Secretary, immediately.

LEIGH INFIRMARY, Leigh, Lancs. Senior House OFFICER in General and Orthopædic Surgery required at Leigh Infirmary. Post now vacant.

Applications, stating age, nationality, and previous hospital appointments, together with the names of 2 referees, should be received by the undersigned as soon as possible.

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan.

MANCHESTER. SAINT MARY'S HOSPITALS. United MANCHESTER HOSPITALS. Applications are invited from registered medical practitioners (Male or Female) for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, starting on 8th March, 1953. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn in the maternity department, the care of infants in the infants' ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned, duly completed, not later than 30th January, 1953, to A. R. WISE, Esq., General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds—recognised under F.R.C.S. regulations.) NORTH AND MID CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR HOUSE OFFICER (surgical), to commence 1st February, 1953. Salary £670 p.a. This appointment, in a busy hospital staffed by Manchester Consultants, offers excellent opportunity of practical surgical experience to suitably qualified candidates.

Applications, together with 2 recent testimonials, to be sent to Secretary, North and Mid Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire, as soon as possible.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) NORTH AND MID CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade), to commence 1st February, 1953. This appointment in a busy general hospital staffed by Manchester Consultants affords excellent experience to suitably qualified candidates. Opportunity will be given to assist in the major surgical work of the Hospital. Application has been made for this post to be recognised under F.R.C.S. regulations.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid Cheshire Hospital Management Committee, Sinderland-road, Altrincham, as soon as possible.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL. (130 Beds.) NORTH AND MID CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Required, JUNIOR HOUSE OFFICER (surgical) to commence duties on or about 7th February, 1953. This is a busy hospital, staffed by Manchester Consultants and a full-time Senior House Officer. Salary £350–£450 p.a., according to previous posts held, less residential emoluments.

Applications should be sent to the Group Secretary, North and Mid Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER (near), ALTRINCHAM. ST. ANNE'S HOSPITAL. (53 Beds—recognised for D.L.O. examination. Staffed by Manchester Consultants.) NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (non-resident), E.N.T. Post offers excellent opportunities of practical experience to suitably qualified Officer, and is tenable for 12 months. Salary, £670 p.a., and Ministry of Health conditions of service.

Applications, stating age, qualifications, &c., to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER, 19. THE DUCHESS OF YORK HOS-PITAL FOR BABIES. MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (Male or Female) for 6 months from 25th February, 1953. Salary in accordance with Ministry of Health scale.

Applications, with copies of 3 testimonials to be sent by 31st January to the Administrative Officer of the Hospital.

MANCHESTER, 4. ANCOATS HOSPITAL. (General Hospital—152 Beds.) Applications are invited for the appointment of HOUSE OFFICER (E.N.T. surgery), vacant 1st February, 1953.

Applications, stating age, nationality, details of qualifications and experience (both with dates), and names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER, 4. ANCOATS HOSPITAL. (General Hospital—152 Beds.) Applications are invited for the appointment of HOUSE OFFICER (orthopædics), vacant mid-January, 1953.

Applications, stating age, nationality, details of qualifications and experience (both with dates), and names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics), vacant at end of March, with duties at Crumpsall Hospital and other hospitals within the Group.

Applications, stating age, qualifications, and dates, particulars of previous appointments with dates, along with the names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR RESIDENT ANÆSTHETIST, vacant on 1st May, 1953. The appointment is for 12 months at a salary of £670 p.a., with a deduction at the rate of £130 p.a. in respect of board and lodging and other services provided. Applicants should have had experience in the specialty.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 14th February, 1953.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. FIRST ASSISTANT (Registrar grade). There will be 2 vacancies in this grade on 1st April, 1953, and applications are invited from suitable candidates. Salary at national scale. There is an establishment of 4 First Assistants—2 of Senior Registrar grade, and 2 of Registrar grade. Initially the appointments will be for 1 year, renewable normally for a second year. The posts are non-resident. The duties include very considerable clinical responsibility for obstetrical and gynæcological cases, including cases dealt with in the "Flying Squad" service. The supervision of House Officers and some teaching of undergraduate medical students are also involved. Candidates must therefore have had full previous experience in obstetrics and gynæcology. A higher qualification is desirable.

Forms of application may be obtained from the undersigned. The closing date is 13th February, 1953.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER REGIONAL HOSPITAL BOARD. BROCKHALL HOSPITAL FOR MENTAL DEFECTIVES, LANGHO, near BLACKBURN (2046 Beds), WHITTINGHAM MENTAL HOSPITAL, near PRESTON (3167 Beds). REGISTRAR in Psychiatry required, for a minimum period of 1 year at each of the above hospitals in succession. Most modern facilities for gaining experience of mental deficiency and psychiatric practice. Choice at each hospital of occupying quarters on the estate (if married) or of enjoying full residential emoluments as a single person. The Medical Officers' quarters are well appointed and comfortable.

Applications, giving full details of experience, and names of 3 referees, to be addressed to the Secretary, Brockhall Hospital, Langho, near Blackburn, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. North MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of REGISTRAR (radiology) for duties mainly at Crumpsall Hospital and also at Booth Hall and Monsall Hospitals in the Manchester Babies' and Children's Group.

Applications, stating age, nationality, details of qualifications and experience (both with dates), along with names and addresses of 2 referees, to be received by the undersigned on or before 2nd February, 1953. A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in General Medicine to the Wigan and Leigh Group of hospitals with main duties at the Royal Albert Edward Infirmary, Wigan.

Forms of application may be obtained from the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, and should be returned, with copies of 2 recent testimonials, to be received by 31st January, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the immediate vacancy of NON-RESIDENT REGISTRAR in E.N.T. Surgery. The duties will be in the Stockport and Buxton Hospital Management Committee Group of hospitals and the successful candidate will be expected to reside within this area.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should reach the undersigned by 7th February, 1953.

H. G. PRICE, Group Secretary,

Stockport and Buxton Hospital Management Committee.

59B, Shaw Heath, Stockport, 17th January, 1953.

MANCHESTER, 8. CRUMPSALL HOSPITAL. (General Hospital—1225 Beds.) Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). The post is tenable for 1 year, and presents opportunity for gaining experience in all branches of clinical pathology. Previous experience in pathology is desirable but not essential.

Applications, stating age, details of experience, and accompanied by the names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER, 20. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered practitioners for 2 SENIOR HOUSE OFFICER posts in the Radiotherapy Department, duties commencing on 1st March and 1st April. The work gives the successful candidate a wide experience of all branches of radiotherapy. In addition he becomes a student for the Course in Radiotherapy run in connection with the Diploma in Radiotherapy of the Royal Colleges.

Applications, stating age, experience, and qualifications (a higher qualification being an advantage), to be sent to the undersigned as soon as possible.

A. H. KEATES, Secretary to the Committee.

Withington Hospital, Manchester, 20.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts :—

Park Hospital, Davyhulme (General Hospital—426 Beds)

SENIOR HOUSE OFFICER (anæsthetics), vacant 31st January, 1953. The Hospital is recognised by the Conjoint Board for training for the Diploma in Anæsthetics.

2 HOUSE OFFICERS (general surgery). 1 post now vacant, the other will become vacant at the end of January, 1953.

HOUSE OFFICER (obstetrics), vacant early February, 1953.

HOUSE OFFICER (non-tuberculous thoracic surgery) for Manchester Regional Hospital Board Centre. Now vacant.

HOUSE OFFICER (general surgery) with some duties in E.N.T. work. Now vacant.

The 2 House Officer (general surgery) posts are recognised for training for the F.R.C.S. examination and the House Officer (obstetrics) post is recognised for training for the M.R.C.O.G. and D.Obst.R.C.O.G. examinations.

Vacancies occur periodically in the various departments at Park Hospital and House Officers are eligible for appointment to another specialty at the end of the original term of service when such vacancies occur.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

SENIOR HOUSE OFFICER. Now vacant.

HOUSE OFFICER. Now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Salaries for House Officer posts £350–£450 p.a., according to experience, plus £50 p.a. for House Officer post Eccles and Patricroft Hospital. £100 p.a. deduction for residential accommodation and services. 6 months appointments. The Senior House Officer appointments will be for 12 months at a salary of £670 p.a., less £130 p.a. (Eccles and Patricroft) ; £155 p.a. (Park Hospital), for residential accommodation and services.

Application forms from the Secretary, Park Hospital, Davyhulme, Manchester.

MANCHESTER. VICTORIA MEMORIAL JEWISH HOSPITAL, MANCHESTER, 8. (Non-sectarian ; General Hospital—105 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (surgery), now vacant, to act as Deputy Resident Surgical Officer.

Applications, stating age, qualifications and dates, particulars of previous appointments with dates, along with the names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER. VICTORIA MEMORIAL JEWISH HOSPITAL, MANCHESTER, 8. (Non-sectarian ; General Hospital—105 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (medicine), vacant on 1st February, 1953.

Applications, stating age, nationality, details of qualifications and experience (both with dates), and names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANSFIELD. KING'S MILL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident or non-resident whole-time post of REGISTRAR (pathology) to the above Hospital, where there is a Group Laboratory serving not only the Mansfield Group of hospitals but also certain other hospitals in the Area. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th February, 1953.

MANSFIELD (near), NOTTS. HARLOW WOOD ORTHOPÆDIC HOSPITAL. (340 Beds.) Applications are invited from registered medical practitioners for the posts of RESIDENT SENIOR HOUSE OFFICERS. The posts are recognised for examination purposes by the Royal College of Surgeons.

Applications, with references or names of referees, to Secretary, Nottingham No. 5 Hospital Management Committee, Harlow Wood, near Mansfield, Notts.

MALVERN, WORCS. ST. WULSTAN'S HOSPITAL. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. The post offers good experience in modern treatment of pulmonary tuberculosis and in all forms of major and minor surgery. Some previous experience in the specialty, either surgical or medical, is necessary. National Health Service conditions of service.

Applications to the Secretary, South Worcestershire Hospital Management Committee, at Worcester Royal Infirmary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments, each being an approved pre-registration post :—

(*a*) HOUSE SURGEON, post now vacant.

(*b*) HOUSE PHYSICIAN, post vacant March, 1953.

Salary at the rate of £350, £400–£450 according to experience. A deduction at the rate of £100 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

(*a*) SENIOR HOUSE SURGEON. Post recognised for the F.R.C.S. (Eng.).

(*b*) RECEIVING ROOM OFFICER.

Salary in each appointment will be £670 a year with deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MEXBOROUGH. MONTAGU HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Required immediately, RESIDENT LOCUM SURGICAL REGISTRAR at the above Hospital for a minimum period of 1 month. Salary at the rate of £16 per week, with a deduction for residential emoluments, of £2 14s. per week.

Applications, giving names and addresses of 2 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10.

MELROSE, ROXBURGHSHIRE. DINGLETON MENTAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER. Salary according to national scale. This Hospital is conducted on the open door system and all modern methods of treatment are employed. Large outpatient attendance. Good experience and opportunities to study for a higher degree. Previous psychiatric experience not essential. Unfurnished self-contained house in Hospital grounds.

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, should be addressed to the Physician-Superintendent as soon as possible.

MID WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE. REGIONAL THORACIC SURGICAL CENTRE; HILL TOP HOSPITAL, BROMSGROVE. HOUSE SURGEON. Post now vacant. All aspects of thoracic surgery dealt with, including cardiac, pulmonary, alimentary and children's diseases.

Applications, with the names of 3 referees, to the Group Secretary, Mid Worcs Hospital Management Committee, Birmingham-road, Bromsgrove.

MORECAMBE. QUEEN VICTORIA HOSPITAL. (100 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative clinics. The post is vacant now and normally tenable for 12 months.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary.

NORWICH. NORFOLK AND NORWICH HOSPITAL. PÆDIATRIC DEPARTMENT AT THE JENNY LIND HOSPITAL FOR CHILDREN. Applications are invited for the appointment of HOUSE SURGEON (Male or Female) in the Surgical Section of the Jenny Lind Hospital, which forms the entire Pædiatric Department of the United Norwich Hospitals. The post is recognised under the Medical Act, 1950, for pre-registration service. The duties are under the direct supervision of the Consultant staff of the Norfolk and Norwich Hospital. Salary £350, £400 or £450, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications and experience, with names of 2 referees, to Secretary, Norwich, Lowestoft and Gt. Yarmouth (Group 6) Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Department. Salary £350–£450 according to experience, less £100 p.a. for residence, &c. 6 months appointment.

Applications, stating age, qualifications, experience, with names of 2 referees to Secretary, Group 6 Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the post of HOUSE SURGEON (Male or Female) at the West Norwich Hospital, Bowthorpe-road, Norwich. Recognised for Final F.R.C.S. examination requirements. The beds at this Hospital are under the control of the Consultant staff of the Norfolk and Norwich Hospital. Salary £350, £400 or £450 according to experience; deduction for residence.

Applications, stating age, qualifications and experience, with names of 2 referees, to Secretary, Group 6 Hospital Management Committee, St. Stephen's-road, Norwich.

NEWCASTLE GENERAL HOSPITAL. (862 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Casualty Department). The above resident (or non-resident) post, tenable for 12 months, becomes vacant on 1st February, 1953.

Applications, with 1 copy of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, as soon as possible.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER to the Ophthalmic Department of the Royal Victoria Infirmary. The appointment will be for 1 year and will be subject to Ministry of Health terms and conditions of service. The salary is at the rate of £670 p.a., subject to the appropriate deductions.

Applications, giving full details, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NOTTINGHAM. CITY HOSPITAL. (837 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery). The post is approved for F.R.C.S. Salary £670 p.a., less £130 p.a. for residential emoluments. The appointment is for 1 year. Post vacant 3rd February, 1953.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (837 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 15th March, 1953. Salary £670 p.a., less £130 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (837 Beds.) Applications are invited for the following posts, vacant 1st March, 1953. (Recognised for pre-registration purposes.)

HOUSE PHYSICIAN.
HOUSE SURGEON.

Salary £350–£450 p.a., according to experience.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Nottingham.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. HOUSE SURGEON (resident) required at the above Infirmary. Salary and conditions of service in accordance with the published conditions of the Ministry of Health. Duties to commence immediately. This post is recognised for the D.O.M.S. examination.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

H. M. STANLEY, Secretary,
Nottingham No. 1 Hospital Management Committee.
General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER for the Casualty Department. Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry; duties to commence as soon as possible.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM CHILDREN'S HOSPITAL. (134 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN (post recognised for pre-registration) which will be vacant on 1st March, 1953, and is recognised for the D.C.H. The post is tenable for 6 months in the first instance. Salary £350–£450 p.a., less emoluments.

Applications, with copies of 2 testimonials, should be sent to the Hospital Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM CHILDREN'S AND CITY HOSPITALS. SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident or non-resident whole-time post of REGISTRAR (paediatrics) to the above hospitals, which are recognised training hospitals for the D.C.H. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th February, 1953.

NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Required, GROUP SENIOR HOUSE OFFICER (Anæsthetist) non-resident, to commence duties on or about 1st February, 1953. Salary £670 p.a. Post recognised for D.A. qualification. This appointment in busy hospitals staffed by Manchester Consultants offers excellent opportunities of practical experience to suitably qualified candidates. The work will be principally at Altrincham General Hospital (130 Beds), and St. Anne's E.N.T. Hospital (53 Beds), but successful candidate will be expected to work at any other hospital in the Group.

Forms of application may be obtained from the Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire, and should be returned with copies of 2 recent testimonials, as soon as possible.

NEWPORT, I.W. ST. MARY'S HOSPITAL. Casualty OFFICER (Senior House Officer), vacant March. Salary £670, less £130 for accommodation and services.

Applications to Chief Administrative Officer, Clatterford House, Carisbrooke, I.W., with copy testimonials.

OTLEY, YORKS. THE GENERAL HOSPITAL. (170 Beds with full Consultant staff who are members of the teaching staff of Leeds University.) ILKLEY AND OTLEY HOSPITAL MANAGEMENT COMMITTEE. SURGICAL/CASUALTY OFFICER required for recognised post to take up duties on 1st February, 1953. Applications invited for either House Officer or Senior House Officer grading.

Applications, stating full particulars, and nationality, to the undersigned as soon as possible.

E. W. BEST, Group Secretary.

PENZANCE. WEST CORNWALL HOSPITAL. (General —100 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY HOUSE SURGEON. Post now vacant.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, West Cornwall Hospital, Penzance.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. GERIATRIC DEPARTMENT. (108 Beds.) Applications are invited from general medical practitioners for an appointment as CLINICAL ASSISTANT; duties assessed at the equivalent of 4 sessions per week, at the rate of £175 p.a. per 3½-hour session. Applicants should state whether they are engaged in general practice, and if so, the number of patients on their National Health Service list.

Applications, stating date of birth, qualifications, and experience, together with names and addresses of 2 referees, to be sent to ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Freedom Fields. Applications invited from registered medical practitioners for the post of PÆDIATRIC HOUSE PHYSICIAN, vacant 6th April, 1953, post recognised for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of:—

(1) HOUSE SURGEON, Devonport Section, vacant 16th February, 1953.

(2) HOUSE SURGEONS, Greenbank Road Section, vacant 13th March, 8th April, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(3) SENIOR HOUSE OFFICER in Surgery, Greenbank Road Section, vacant 13th March, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(4) SENIOR HOUSE OFFICER in Casualty and Fracture Department, Greenbank Road Section, vacant 31st January, 1953.

(5) HOUSE SURGEON, Freedom Fields Section, vacant 22nd February, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(6) SENIOR HOUSE OFFICER in Anæsthetics, Freedom Fields Section, vacant immediately, for a period of 12 months.

(7) RESIDENT ANÆSTHETIST, Greenbank Road Section, vacant 31st March, 1953, recognised for the D.A.

Applications, stating age, nationality, qualifications and experience, with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Devonport.

PORTSLADE. FOREDOWN HOSPITAL for Infectious Diseases. (60 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (non-resident) at above Hospital, vacant 6th February, 1953. Salary £700–£50–£1000. The post will include duties to be arranged at other hospitals in the Group.

Applications, stating age, qualifications, nationality, previous posts held, with names of 2 referees, to Administrative Officer, Hove General Hospital, Sackville-road, Hove, 3, not later than 30th January, 1953.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary at the Hospital.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments:—

Saint Mary's Hospital (general hospital with 150 acute surgical beds and 74 acute medical beds) which is recognised for the F.R.C.S.

1 SENIOR HOUSE PHYSICIAN, vacant 26th February, 1953.

1 HOUSE PHYSICIAN, vacant 6th February.

3 HOUSE SURGEONS, vacant 28th January, 3rd and 15th February.

Royal Portsmouth Hospital (60 medical and 70 surgical beds)

2 HOUSE SURGEONS, vacant now and 16th February.

Queen Alexandra Hospital (40 medical beds)

1 SENIOR HOUSE PHYSICIAN, vacant now.

Chest Services (160 Beds)

1 HOUSE PHYSICIAN, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of E.N.T. REGISTRAR vacant on 20th April, 1953. Duties will be mainly at the Portsmouth Eye and Ear Hospital (recognised for D.L.O.) and Queen Alexandra Hospital.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 6th February, 1953. Canvassing will disqualify. Candidates may visit the above hospitals by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointment:—

Saint Mary's Hospital (773 Beds)

PÆDIATRIC HOUSE PHYSICIAN, now vacant. There is a Pædiatric Unit of 53 Beds, together with responsibility for 60 neonatal cots, and the post is recognised for candidates preparing for the D.C.H.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to E. H. HURST.

35, Grove-road South, Southsea.

PORTSMOUTH. ROYAL PORTSMOUTH HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following post vacant on 3rd March, 1953: ANÆSTHETIC REGISTRAR at the above Hospital.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 6th February, 1953. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Secretary of the Group.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Clinical Pathology required at Group Laboratory. Visits by arrangement with Group Pathologist.

Application forms obtainable from Group Secretary at above address.

READING AREA HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER (pathology), vacant immediately. Deduction, if resident, £100. Previous experience in pathology desirable but not essential.

Apply, stating age, qualifications with dates, nationality, present post, together with copies of recent testimonials, to Group Secretary, 3, Craven-road, Reading.

READING. ROYAL BERKSHIRE HOSPITAL (403 Beds) and BATTLE HOSPITAL (340 Beds). Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON (Accident and Orthopædic Department), vacant 1st February, 1953, for periods of 6 months. Also casualty duties.

Apply, stating age, nationality, qualifications with dates, present post, together with copies of 3 recent testimonials, to Hospital Assistant Secretary, Royal Berkshire Hospital.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology). Applications are invited for the above appointment, tenable for a period of 1 year, which will be vacant on 1st March, 1953. The Hospital which is recognised for the D.Obst.R.C.O.G. has a Maternity Unit of 70 Beds, a Gynæcological Ward of 25 Beds, and a Premature Baby Unit of 8 Cots. Salary £670 p.a., less the appropriate charge for residential emoluments, married accommodation may be available in due course. Previous experience in obstetrics and gynæcology is essential.

Applications, stating age, qualifications with dates, nationality, previous experience, accompanied by copies of 3 recent testimonials, should be sent to the undersigned not later than 7th February, 1953. J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum RESIDENT MEDICAL REGISTRAR (Chest Unit) on a month-to-month basis, from approximately the middle of February. Duties in active treatment Chest Unit of 72 Beds at the General Hospital, Rochford; 24 Beds at Westcliff Hospital and attendance at the Lancaster House Chest Clinic, Southend, for clinical duties and assistance with refills. Good experience in non-tuberculous chest disease as well as tuberculosis is available.

Applications, &c., should be sent not later than 7th February, 1953, to J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC HOUSE SURGEON (resident) in the Orthopædic and Accident Unit. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. The post, tenable for 6 months, is recognised under F.R.C.S. regulations.

Applications, stating age, nationality, qualifications with dates, present appointment and experience, and 2 recent testimonials or names of 2 referees, should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Department of Ophthalmology.

Applications, stating age, qualifications, present appointment, and experience with dates, together with copies of 2 testimonials of recent date, or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident) in the General Surgical Unit vacant from 1st March, 1953. 6 months appointment. This very active General Surgical Unit of approximately 100 Beds affords ample opportunity for candidates to obtain first-class tuition and experience. Appointment recognised for F.R.C.S. examination.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (247 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE OFFICER (general surgery) at the above Hospital, vacant from 25th January, 1953. 6 months appointment. Post is recognised for F.R.C.S.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be addressed immediately to the Medical Superintendent.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (247 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) at the above Hospital. Good experience in anæsthetics for general surgery, gynæcology, and E.N.T. Modern equipment.

Applications, stating age, nationality, qualifications with dates, present appointment, and experience, should be addressed to the Medical Superintendent as soon as possible. Applicants may see the Hospital by arrangement (Telephone No. Romford 7711).

ROMFORD, ESSEX. VICTORIA HOSPITAL. (91 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE PHYSICIAN vacant from 1st March, 1953. The duties will include experience in gynæcology. 6 months appointment.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (91 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE SURGEON, vacant from 6th March, 1953. 6 months appointment.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROCHDALE INFIRMARY. Rochdale and District Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics). Post recognised for 6 months for F.R.C.S. examination.

Apply at once to S. HODKINSON, Group Secretary.
Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE INFIRMARY. Rochdale and District Hospital MANAGEMENT COMMITTEE. HOUSE SURGEON. Post recognised for 6 months for F.R.C.S. examination.

Apply at once to S. HODKINSON, Group Secretary.
Central Offices, Birch Hill Hospital, Rochdale.

SALFORD ROYAL HOSPITAL. Salford Hospital Management COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Urological Department. The position, which offers a wide experience in urology, is recognised for the F.R.C.S. and is tenable for 6 or 12 months. Salary £670 p.a., less £155 for board and lodging.

Applications, with copies of 3 recent testimonials, should be sent immediately to the Hospital Secretary, Salford Royal Hospital, Salford, 3.

SALFORD ROYAL HOSPITAL. Salford Hospital Management COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). The position, which offers wide experience in all branches of anæsthetics, is recognised for the D.A. Salary subject to a deduction of £155 p.a. for board and lodging.

Applications, with copies of 3 recent testimonials, should be sent immediately to the Hospital Secretary, Salford Royal Hospital, Salford, 3.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN for a period of 6 months from 21st February, 1953.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON for a period of 6 months from 28th February, 1953.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of SENIOR REGISTRAR in Anæsthetics. Duties mainly at Royal Northern Infirmary and Raigmore Hospital, Inverness, where accommodation for a single Officer is available.

Forms of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by Saturday, 7th February, 1953.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time non-resident post of SURGICAL REGISTRAR to the Inverness Hospitals.

Further particulars and application schedules can be obtained from the undersigned, with whom applications should be lodged by 27th January, 1953.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time post of MEDICAL REGISTRAR at the Inverness Hospitals. The duties are mainly at the Royal Northern Infirmary, Inverness.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 7th February, 1953.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND NORTH-EASTERN REGIONAL HOSPITAL BOARD. LADYSBRIDGE MENTAL HOSPITAL, near BANFF. Applications are invited for the post of ASSISTANT PSYCHIATRIST (Junior Hospital Medical Officer) whose principal duties would be at the above Hospital. The functions of the Hospital are in a transitional state and preference will be given to candidates having some experience in mental deficiency work. Salary is within the scale £700–£50–£1000 p.a., with appropriate deductions for quarters and services provided. Residential accommodation for a married man is available. Terms and conditions are as laid down for hospital medical and dental staffs.

Applications, together with the names of 2 referees, should be lodged by 6th February, 1953, with the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the appointment of REGISTRAR in Radiodiagnosis based at Glasgow Royal Infirmary, which will be for 1 year in the first instance. The above appointment will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, and present appointment, and giving the names of 3 referees, should be submitted not later than 9th February 1953, to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the appointments of 2 REGISTRARS in Surgery, 1 based at Law Hospital, Carluke, and the other with primary attachment to the Royal Alexandra Infirmary, Paisley, which will be for 1 year in the first instance. The above appointments will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and giving the names of 3 referees, should be submitted not later than 9th February, 1953, to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (orthopædics) to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 2nd February, 1953.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (269 Beds.) SCUNTHORPE HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Senior House Officer grade) required for 1st February in modern, well-equipped hospital providing good clinical experience.

Applications, naming 2 referees, to Group Secretary, War Memorial Hospital, Scunthorpe, Lincs.

SWANSEA HOSPITAL. (403 Beds.) **Glantawe Hospital** MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the non-resident appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of Swansea Hospital. The post is recognised for the F.R.C.S.(Eng.), and D.O. examination.

Applications, stating age, qualifications and experience, should be addressed to—

O. C. HOWELLS, Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA. MORRISTON HOSPITAL. (450 Beds.) Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER in the Neurological and Neurosurgical Department.

Applications, stating age, qualifications and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea. O. C. HOWELLS, Secretary,
Glantawe Hospital Management Committee.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (general surgery), vacant 1st March, 1953. The Hospital is recognised for F.R.C.S. examination and the post is recognised for experience during pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous services, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. STANFIELD SANATORIUM, BURSLEM. (91 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the Sanatorium.

Applications, giving age, nationality, and full details of previous experience, together with copy testimonials, should be forwarded as soon as possible to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ASSISTANT CLINICAL PATHOLOGIST to the Stoke-on-Trent Group of hospitals. The post is of Junior Hospital Medical Officer status, but applicants with less than the qualifying 2 years registration period will be considered, in the grade of Senior Hospital Officer. The laboratory is recognised for the Diploma in Clinical Pathology and also for the Diploma in Pathology, and the post offers excellent experience in hospital laboratory work.

Applications, giving full details of previous experience, age, and nationality, together with copies of 2 testimonials, should be forwarded forthwith to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (House Officer grade), vacant immediately. Post recognised for the D.A.

Applications, stating age, nationality, qualifications, and previous hospital appointments, together with copies of recent testimonials, should be sent to—

J. P. MALLETT, Group Secretary,
Shrewsbury Group Hospital Management Committee.

Royal Salop Infirmary, Shrewsbury, 16th December, 1952.

SHOTLEY BRIDGE GENERAL HOSPITAL, Consett, CO. DURHAM. NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (obstetrics and gynæcology), required for 6 months in the first instance. Duties in Obstetrical (30 Beds) and Gynæcological (45 Beds) Departments.

Apply, stating experience and enclosing 3 recent testimonials, to the Secretary.

ST. ALBANS CITY HOSPITAL. (372 Beds.) Mid Herts GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (House Officer grade) required to 1 of the 2 medical teams for duties mainly in the acute wards. Post vacant about 23rd February, 1953. Preference will be given to candidates seeking pre-registration post under the Medical Act, 1950.

Applications, giving age, qualifications, and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans.

SHEFFIELD CHEST SERVICE. Sheffield Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (chest diseases) for the above Service, with duties mainly at the Winter-street Hospital, Sheffield. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th February, 1953.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited for the non-resident post of REGISTRAR in E.N.T. Surgery at the above Hospital.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited for the following resident posts :—

(*a*) HOUSE SURGEON. Post vacant.
(*b*) HOUSE SURGEON in Orthopædics. For 3 months from 15th March.
(*c*) HOUSE SURGEON to the E.N.T. Department. Post vacant.

Posts (*a*) and (*b*) are pre-registration appointments.

Applications, with copy testimonials, to be sent immediately to the Superintendent, Royal Hospital, West-street, Sheffield, 1.

SHEFFIELD. KING EDWARD VII ORTHOPÆDIC HOSPITAL, Rivelin Valley-road, SHEFFIELD, 6. (140 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male or Female practitioners for the appointment of HOUSE SURGEON or SENIOR HOUSE OFFICER (according to experience), resident or non-resident. The Hospital has at present a complement of 140 Beds, of which 100 are occupied by children. The post would involve a fair amount of medical work as well as orthopædics. Salary £670 p.a., less authorised deductions in respect of residential emoluments.

Applications, stating age, qualifications and experience, with names of 2 referees, should be addressed to the Group Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited from suitably qualified medical practitioners for the resident post of SENIOR HOUSE OFFICER to the Thoracic Surgery Unit at present vacant. Preference will be given to candidates with experience in chest diseases and holding a higher surgical qualification.

Apply, giving full details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (psychiatry) to the above Hospital, which is a recognised training hospital for the D.P.M. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 2nd February, 1953.

SHEFFIELD. CITY GENERAL HOSPITAL. Group LABORATORY. Applications are invited for the post of SENIOR HOUSE OFFICER in Clinical Pathology. Facilities for all round training in all branches of pathology.

Apply, giving full details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary,
Sheffield No. 1 Hospital Management Committee.

SHEFFIELD. WHARNCLIFFE HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the whole-time post of SURGICAL REGISTRAR to the above Hospital, with additional duties in the Orthopædic Department. Single accommodation is available if required. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th February, 1953.

SHOREHAM-BY-SEA. SOUTHLANDS HOSPITAL. Required, RESIDENT HOUSE SURGEON, pre-registration or registered practitioner. Post recognised by R.C.S. for Fellowship ; vacant 12th February, 1953. Salary and conditions in accordance with national scale. This post is recognised as pre-registered under the Medical Act.

Application forms to be obtained from, and returned as soon as possible to, Surgeon-Superintendent, Southlands Hospital, Shoreham-by-Sea.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

SLOUGH. UPTON HOSPITAL. (213 Beds—General and Midwifery.) Application is invited for the post of SENIOR HOUSE OFFICER (Department of Obstetrics and Gynæcology). Preference will be given to applicants who have had previous experience in a general medical or surgical appointment. The post is resident and becomes vacant on 12th February and is for 1 year.

Applications, stating age, qualifications, and previous experience, together with copies of 2 recent testimonials, should reach the Hospital Secretary not later than 31st January, 1953.

STOCKPORT AND BUXTON HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) to the above Group. The post, which is recognised for the D.A., will be resident at Stepping Hill Hospital, Stockport. There is another Senior House Officer (anæsthetics) in the Group.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, should reach the undersigned by 7th February, 1953. H. G. PRICE, Secretary.

59B, Shaw-heath, Stockport, Cheshire.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in E.N.T. Surgery to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th February, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals, for duty mainly at Bevendean Hospital, Bear-road, Brighton, 1, which is a Unit of approximately 150 Beds devoted to the active treatment of tuberculosis, and also at Chest Clinics in the Area. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th February, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Medway and Gravesend Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th February, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Dartford Group of hospitals, for duty mainly at The Bow Arrow Hospital, Dartford, Kent, which is a Unit of approximately 150 Beds devoted to assessment and early treatment of tuberculosis, including primary tuberculosis in children, and also at Chest Clinics in the Area. Candidates must have had wide experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th February, 1953.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time SENIOR RADIOLOGICAL (DIAGNOSTIC) REGISTRAR at the Royal South Hants Hospital, Southampton. Previous experience essential. The appointment entails duties at other hospitals in the Group. Candidates may visit the Hospital if they so desire.

Forms of application, which should be returned to the undersigned by 7th February, 1953, will be forwarded on receipt of a stamped addressed envelope.

FRANK JENNINGS, Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (80 surgical beds.) HOUSE SURGEON (resident) required end of January. Post recognised for F.R.C.S. and tenable for 6 months.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street. Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds—Recognised for F.R.C.S.) HOUSE SURGEON (resident) required immediately. Post tenable 6 months.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (280 Beds), AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. Post recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post tenable 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SWINDON HOSPITAL GROUP. (536 Beds.) Applications invited for appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade). Work of Accident and Orthopædic Department, being associated with Wingfield-Morris Orthopædic Hospital, Oxford, includes large number of industrial injuries. Residential emoluments £120 p.a.

Full details, giving names of 2 referees, to Secretary, 7, Okus-road, Swindon, as soon as possible.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE SURGEON (general surgery). Post recognised for F.R.C.S.

Applications, stating age, qualifications, with dates, and nationality, together with 2 recent testimonials, should be sent immediately to the Secretary, Musgrove Park Hospital, Taunton.

TAUNTON AND SOMERSET HOSPITAL. (Musgrove Park and East Reach Branches.) TAUNTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post vacant 1st February, 1953, of SENIOR HOUSE OFFICER (anæsthetics). The Hospital is recognised for training for the D.A. and previous experience in anæsthesia, while desirable, is not essential.

Applications, stating age, qualifications with dates, and details of experience, together with 2 testimonials, should be sent immediately to the Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR REGISTRAR to the Group Department of Clinical Pathology, for duties at the General Hospital, Southend, and the General Hospital, Rochford. The post is non-resident whole-time and pending the decision of an establishment, tenable in the first instance for a period of 6 months. Applicants should have been qualified for at least 4 years and have at least 2 years previous experience in pathology. Facilities for training provided in all branches of pathology.

Applications, with names of 2 referees, should be forwarded to reach the undersigned at the General Hospital, Southend, as soon as possible. J. C. FIELD, Secretary,
Southend Hospital Management Committee.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (general surgery).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (medical).

Applications, with copy testimonials, and details of previous appointments held, should be forwarded to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds—9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the combined pre-registration post of JUNIOR HOUSE PHYSICIAN AND HOUSE SURGEON (E.N.T. and Ophthalmic Departments), vacant now.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, to the Hospital Secretary.

TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. PEMBURY HOSPITAL, PEMBURY. (624 Beds.) Applications invited for post of RESIDENT ANÆSTHETIST (Senior House Officer). Post vacant in February, 1953, tenable for 12 months, recognised for D.A. examination.

Apply Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9. WAKEFIELD A GROUP. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade) £670 p.a. The Hospital is recognised for the F.R.C.S. (Eng.), and the post offers excellent experience in general surgery.

Applications should be made to the undersigned as soon as possible. W. READ, Group Secretary.

WATFORD MATERNITY HOSPITAL, King-street, WATFORD. (58 Beds.) Applications are invited for the resident post of SENIOR OBSTETRIC OFFICER for duties commencing at the beginning of March. Salary £670 p.a., less £130 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examinations.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Administrator not later than 2nd February.

WATFORD MATERNITY HOSPITAL, King-street, WATFORD. (58 Beds.) Applications are invited for the resident post of JUNIOR OBSTETRIC OFFICER for duties commencing at the beginning of March. Salary £350–£450 p.a. according to experience, less £100 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examinations.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Administrator not later than 2nd February.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) HOUSE SURGEON (Male or Female), vacancy at the end of January for a House Surgeon (pre-registration post) at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Senior House Officer, and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL, Edward-street, WEST BROMWICH. (144 Beds.) Applications are invited for the post of HOUSE SURGEON (first second, or third post). Range of salary £350–£450 p.a. according to experience, with deduction of £100 p.a. in respect of board and lodging. The post is tenable for 6 months.

Applications, together with 3 recent testimonials, should be submitted to—
JOHN O. ROBINS, Secretary, West Bromwich and
District Hospitals Management Committee Group (18).

WOKING VICTORIA HOSPITAL, Woking, Surrey. (72 Beds.) HOUSE OFFICER required (medical and surgical duties), resident. Salary and conditions of service as laid down by Ministry of Health.

Apply, with testimonials, to Hospital Secretary quoting ref. L.T.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointments of 2 HOUSE SURGEONS (first, second, or third posts), vacant 1st March, 1953. The appointments will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR in Psychiatry at Whitchurch Hospital, Whitchurch, Glam. The Hospital provides all modern methods of treatment and accommodates approximately 799 patients (male and female). The post will be subject to review annually.

Forms of application should be obtained from Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of a REGISTRAR in Paediatrics to serve the Caernarvon and Anglesey Hospital Management Committee. The successful candidate will be based on the County Hospital, Bangor (140 Beds for women and children). The post is non-resident and will be subject to review at the end of the first year. Possession of a car will be an advantage.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of a REGISTRAR in General Surgery to serve the Mid Glamorgan Hospital Management Committee. The successful candidate will be based at Neath General Hospital (412 Beds), and will also be expected to serve other hospitals in the group. The post may be resident or non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained immediately from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Medicine to serve the Newport and East Monmouthshire Hospital Management Committee. The successful candidate will be based at the Royal Gwent Hospital, Newport, Mon. (259 Beds), and may also be expected to serve other hospitals in the Group. The post will be non-resident and be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in E.N.T. Surgery to serve the Caernarvon and Anglesey Hospital Management Committee. The successful candidate will be based on the Caernarvon and Anglesey General Hospital, Bangor. There are ample opportunities for practical work and research. The post is non-resident and subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WINLATON, BLAYDON ON TYNE, co. DURHAM. NORMANS RIDING HOSPITAL. (Tuberculosis—76 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER at the above Hospital. Normans Riding Hospital is modern in every respect and is being developed into a first-class Acute Tuberculosis Sanatorium (surgical unit). Previous experience in the diagnosis and treatment of pulmonary tuberculosis is desirable.

Applications, stating age, experience, and submitting the names of 3 referees, or 3 references, should be sent to—

H. CLARK, Group Secretary,
Gateshead and District Hospital Management Committee,
"The Lodge," I.D. Hospital, Sheriff Hill, Gateshead, 9, co. Durham.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE OFFICER (anæsthetics), vacant immediately. The Hospital is recognised for the D.A.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. SENIOR HOUSE OFFICER (orthopædics) required, vacant immediately. Appointment will be for 6 months in the first instance. Salary £670 p.a., less £150 for board and residence.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE SURGEON (general and E.N.T.), pre-registration appointment. Vacant 2nd March.

Applications, with copies of 2 testimonials, to the Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 28th February. Post recognised for F.R.C.S. Preference will be given to persons seeking a pre-registration House Officer post under the Medical Act, 1950. Salary on national scale.

Applications, stating age, qualifications with dates, and nationality, together with copies of recent testimonials, should be sent to the Hospital Secretary within 14 days.

WINDSOR. KING EDWARD VII HOSPITAL. GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female. Post vacant 2nd February. Salary on national scale. The successful candidate will be resident at Old Windsor Unit of this Hospital. Applicants are required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, together with copies of recent testimonials or the names of 3 referees, should be sent to the Hospital Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. WORTHING HOSPITAL, Lyndhurst-road, WORTHING, SUSSEX. (272 Beds—5 Resident Officers.) Applications are invited from registered medical practitioners for post of HOUSE SURGEON for special departments (new appointment). Accommodation available for male or female staff. R practitioners within 3 months of qualification or holding a first post may apply. Salary £350–£450 according to experience, less £100 p.a. for board, lodging, &c. Appointment subject to conditions of service for the National Health Service.

Apply to Hospital Secretary, Worthing Hospital, stating age, qualifications with dates, nationality, and details of experience, together with copies of 2 recent testimonials.

A. V. OAKTON, Group Secretary.

WORKSOP, NOTTS. VICTORIA HOSPITAL. (127 surgical beds.) HOUSE SURGEON required immediately, duties include Orthopædic and E.N.T. Departments. Appointment for 6 months in first instance. Salary £350–£450 according to experience, less deduction of £100 p.a. residential emoluments.

Applications, stating age, qualifications, nationality, together with copies of recent testimonials, to be forwarded to the Secretary, Worksop and Retford Hospital Management Committee, Victoria Hospital, Worksop, Notts.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks

(*a*) SENIOR ORTHOPÆDIC HOUSE SURGEON, vacant now. Recognised for F.R.C.S.

(*b*) RESIDENT PATHOLOGIST (Senior House Officer), in Area Laboratory, with attendance at Branch Laboratory, Driffield. Post vacant shortly. Offers experience all branches pathology.

East Riding General Hospital, Driffield, Yorks

(*c*) SENIOR HOUSE PHYSICIAN, vacant now. Would suit applicant reading for higher degree.

(*d*) HOUSE PHYSICIAN (first, second, or third post), vacant now. Duties include medical and chronic wards, casualty and some anæsthetics and midwifery. Good general experience for first House appointment.

Broadgate (Mental) Hospital, Beverley, Yorks

(*e*) HOUSE PHYSICIAN (first, second or third post), vacant 1st March, 1953.

Northfield Sanatorium, Driffield, Yorks

(*f*) HOUSE PHYSICIAN (first, second, or third post), vacant now. Sanatorium has 78 Beds for adults.

Salary for (*a*), (*b*) and (*c*) is £670 p.a. and for (*d*), (*e*) and (*f*) is £350–£450 according to previous posts held.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

City Hospital, York (Modern general hospital of 265 Beds with full consultant staff)

CASUALTY OFFICER AND ORTHOPÆDIC OFFICER (resident or non-resident) as from 1st February. Junior Hospital Medical Officer grade. £700–£50–£1000, residence available at a charge of £153 p.a.

Military Hospital (Civilian Wing—60 Beds)

SENIOR HOUSE OFFICER (resident or non-resident), immediately. There are 18 gynæcological beds, 30 general surgical beds, and 12 medical beds. The Hospital is associated with the County Hospital (general hospital of 269 Beds) where relief casualty and emergency work and relief work for House Surgeons may be undertaken and where residence can be provided. Salary £670, less £153 for residence.

County Hospital, City Hospital and Military Hospital (Civilian Wing) York (General hospitals of 269, 265 and 60 Beds respectively)

SENIOR HOUSE OFFICER in Anæsthetics (resident or non-resident) as from 1st March. Salary £670, residence available at a charge of £153. Previous experience in anæsthetics desirable but not essential.

City Hospital, York (Modern general hospital of 265 Beds with full consultant staff)

2 RESIDENT HOUSE SURGEONS immediately. Posts recognised under F.R.C.S. regulations. Wide experience offered. Salary £350, £400 or £450, less £100 for residence.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, immediately to Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

NEW YORK. ALBANY HOSPITAL. Approved Internship, ASSISTANT RESIDENCY, and RESIDENCY in E.N.T. available 1st July, 1953, in Albany Hospital, affiliated with Albany Medical College. Salary $1020–$2120. Room, uniforms, and laundry supplied.

Inquire, Medical Director, Albany Hospital, Albany, New York, U.S.A.

NEW YORK. ALBANY HOSPITAL. Internships and RESIDENCIES available in 750-Bed, general, private Hospital, directly connected to Albany Medical College. Approved for all major specialties, including psychiatry, and accepted by the U.S. State Department as member of Exchange Visitor Program. Annual salary range is $1020 for Intern to $2120 for Resident, with laundry, uniforms, room, and annual vacation furnished. All appointments begin July, 1953.

Address inquiries to Medical Director, Albany Hospital, Albany, New York.

NEW YORK CITY. State University of New York College of Medicine at New York City in affiliation with Kings County Hospital now offers a 2-year RESIDENCY in Anesthesiology.
For further information write to MEREL H. HARMEL, M.D.
Kings County Hospital, 451, Clarkson-avenue,
Brooklyn, N.Y.

PENNSYLVANIA. MERCY HOSPITAL. Radiology RESIDENCY available 1st July, approved 3 years. 750-Bed hospital affiliated with medical school. Salary $150 per month with maintenance.
Apply to C. R. PERRYMAN, M.D.
Mercy Hospital, Pittsburgh 19, Pa.

Public Appointments

AUSTRALIA. STATE PUBLIC SERVICE, Queensland. Applications are invited from qualified medical practitioners for appointment as MEDICAL OFFICER on the staff of a Mobile X-ray Clinic established for mass radiography. The salary range is minimum £A1580 p.a., maximum £A1830 p.a., inclusive of present basic wage adjustments and subject to any further such adjustments. Salary in excess of the minimum may be paid according to the qualifications and experience of the appointee. The appointee will be required to have a specialised knowledge of radiology and training in tuberculosis work. The Clinic will travel throughout Queensland, and the appointee will be paid travelling and sustenance allowances in accordance with Public Service Regulations. Further particulars may be obtained from the Agent-General for Queensland, London.
Applications should contain particulars of full name, date of birth, marital state, children, particulars of any war service, and full details of qualifications and experience, and should be accompanied by references or certified copies of references. Applications should be forwarded by air-mail so as to reach the Secretary, Public Service Commissioner's Department, Box 488H, G.P.O. Brisbane, Australia, by 28th February, 1953.

BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION COMMITTEE. ASSISTANT SCHOOL MEDICAL OFFICER. Candidates must have had at least 3 years experience in the practice of their profession subsequent to obtaining a registrable qualification. Salary £850–£50–£1150 p.a. Previous experience in Local Government Service may be taken into account.
Forms of application (returnable by 7th February) together with further information, obtainable from the undersigned on receipt of a stamped, addressed foolscap envelope. Communications should be endorsed "Assistant School Medical Officer." Canvassing disqualifies.
E. L. RUSSELL, Chief Education Officer.
School Health Service, Queen's College Chambers,
38A, Paradise-street, Birmingham, 1.

LINCOLN. COUNTY OF LINCOLN. Parts of Kesteven. Applications are invited from registered medical practitioners holding a Diploma in Public Health for the joint appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Urban Districts of Bourne and Sleaford and the South Kesteven Rural District (population approximately 26,697). The inclusive salary will commence at £1306 5s., rising by annual increments to a maximum of £1593 15s. The person appointed will be required to provide a car and will be paid a travelling allowance. Applicants should be conversant with the duties of Medical Officer of Health, School Medical Officer, and Medical Officer for Maternity and Child Welfare, and experience in examination of handicapped children is desirable. The Officer will act under the general control and supervision of the County Medical Officer of Health as Assistant School Medical Officer and Medical Officer to Infant Welfare Centres and will be required to perform such other duties as may from time to time be prescribed by the County Council. The Officer appointed will be required to perform in the Districts of the Local Sanitary Authorities referred to all the duties imposed on the Medical Officer of Health by the relevant Acts, Orders, and Regulations. As regards the duties of Medical Officer of Health, the Officer appointed will be subject to the control of the District Councils concerned. The Officer will also be required to devote the whole of his or her time to the duties of the office and to reside at Bourne. The appointment will be subject to the appropriate superannuation regulations and the selected candidate will accordingly be required to pass a medical examination. The appointment will be subject to 3 months notice to be given or received by the Clerk of the County Council.
Applications (upon forms to be obtained from the Clerk of the County Council, County Offices, Sleaford), with names of 3 referees, must be returned not later than 28th February, 1953. Canvassing, either directly or indirectly, will disqualify. The appointment will be made in accordance with Section 103 of the Local Government Act, 1933, and the Sanitary Officers (Outside London) Regulations, 1935.
J. E. BLOW, Clerk of the County Council.
County Offices, Sleaford, Lincs, January, 1953.

PORTSMOUTH. CITY OF PORTSMOUTH. Public HEALTH DEPARTMENT. Applications are invited from registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH; preference will be given to candidates possessing the D.P.H. The doctor appointed will be responsible to the Medical Officer of Health for the operation of the Department's Immunisation and Vaccination Service and the Disinfestation (Scabies and Pediculosis) Clinic, and will also be required to carry out any other duties as he may direct. The salary scale is £850–£50–£1150, and regard will be had to previous service when fixing the commencing salary. The successful applicant will be required to pass a medical examination.
Application forms may be obtained from, and should be returned to, the Medical Officer of Health, 1, Western-parade, Portsmouth, not later than Saturday, 14th February, 1953.
V. BLANCHARD, Town Clerk.
City Council Chambers, 1, Clarence-parade, Portsmouth.

FACTORY DOCTORS: Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Closing date for application*
TAMWORTH ..	STAFFORD ..	7TH FEBRUARY, 1953
BATLEY ..	YORK	7TH FEBRUARY, 1953

HER MAJESTY'S COLONIAL SERVICE. Kenya. Medical OFFICERS are required as follows:—
(*a*) For general duties which include some administrative and public health as well as general hospital work. Applications are also invited from holders of the F.R.C.S.
(*b*) For School duties, including supervision of the public health aspect of European, Asiatic and African Schools, with particular reference to health education and nutrition, and clinical examinations; the work involves considerable travelling in towns and African Reserves. (Applicants must be able to drive a car.) The post offers opportunity for basic research in a recently inaugurated service. A woman would be acceptable for this post.
Appointments can be made on a permanent basis with pension (non-contributory) at age of 55, or on short-term contracts with gratuity on satisfactory completion of service. Salary is paid in the scale £865–£935–£35–£1005–£45–£1140–£45–£1320–£45–£1590 p.a.; starting-point is determined by experience and war service, and special credit is given for the F.R.C.S. Temporary cost-of-living allowance of 30% of salary, subject to maximum of £300 p.a. also payable. Quarters provided at rental of 10% of salary. Free passages in both directions for Officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 40 to 48 months. Educational facilities are available. Medical Officers are eligible for promotion to administrative super-scale posts in Kenya and other colonial territories and also, if they have higher qualifications and suitable experience, for specialist appointments. Candidates must possess medical qualifications registrable in the United Kingdom and at least 1 years postgraduate hospital experience.
Application forms from Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting ref.: No. CDE. 117/7/02).

HER MAJESTY'S COLONIAL SERVICE. Barbados. An ASSISTANT MEDICAL SUPERINTENDENT is required for the Mental Hospital for general clinical duties and to undertake general superintendence and control in the absence of the Medical Superintendent. Appointment will be on a permanent basis with pension (non-contributory) at the age of 55, or on agreement for 3 years (in which event regulations governing passages and quarters are slightly different). Salary scale ranges from $4128 to $5280 (£860–£1100) p.a. (1 Barbados dollar equals 4s. 2d.) Unfurnished quarters are available at rental of 5% of salary. Free passages on appointment are provided for Officer and family up to a maximum cost of £300. Free passages on leave are provided for Officer and wife only at end of tour of service of 3½ years (pro rata payment on completion of not less than 2 years of tour). Home leave may be granted on full pay after each tour. Income-tax at local rates. Social and recreational amenities are good. Climate is healthy for Europeans. Educational facilities are available. Candidates must possess qualifications registrable in the United Kingdom, and have had experience in mental diseases. Possession of a Diploma in Psychological Medicine is desirable but not essential.
Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE/117/28/03).

NOTTINGHAM. CITY OF NOTTINGHAM EDUCATION COMMITTEE. Applications are invited from registered medical practitioners for the post of Whole-time ASSISTANT SCHOOL MEDICAL OFFICER. Applicants should have had not less than 3 years experience since qualifying. Special consideration will be given to the applications of candidates who have had experience in work with children and who possess the D.P.H. or D.C.H. Salary scale £850–£50–£1150 p.a. The selected candidate will be required to pass a medical examination and the appointment will be superannuable.
Applications, stating age, and giving full particulars of qualifications and experience, and the names and addresses of 3 referees, should be sent to Dr. A. A. E. Newth, 28, Chaucer-street, Nottingham, within 14 days of the publication of this advertisement. F. STEPHENSON, Director of Education.

NEWCASTLE. CITY AND COUNTY OF NEWCASTLE UPON TYNE EDUCATION COMMITTEE. Applications are invited from medical practitioners with experience in the administration of dental anæsthetics for the appointment of Part-time ANÆSTHETIST in the School Dental Service. Duties will comprise attendance at not more than 6 sessions each week at the various school clinics. Remuneration is at the rate of £500 p.a. The appointed candidate will work under the direction of the Senior Dental Officer.
Application should be made in writing to the Medical Officer of Health, Town Hall, Newcastle upon Tyne, 1, not later than 14 days after the appearance of this advertisement.
H. V. LIGHTFOOT, Director of Education.

SWINDON. BOROUGH OF SWINDON. Applications are invited from duly qualified medical practitioners holding Diploma in Public Health or similar qualification for the appointment of DEPUTY to the Medical Officer of Health and Borough School Medical Officer who is also Area Medical Officer under the Wiltshire County Council. The salary and conditions of service will be in accordance with the award of the Industrial Court. The present salary is at the rate of £1034 p.a., rising by 4 increments of £54 10s. to a maximum of £1252 p.a.
Forms of application and further particulars of the post may be obtained from the undersigned with whom applications should be lodged not later than Monday, 16th February, 1953.
D. MURRAY JOHN, Town Clerk.
Civic Offices, Swindon, Wilts, 9th January.

ROYAL AUSTRALIAN NAVY. Medical Officers. Applications are invited from legally qualified medical practitioners for appointment as SURGEON LIEUTENANTS in the Royal Australian Navy. All money figures are Australian currency. Minimum yearly emoluments on appointment are: married Officers £A1490, single Officers £A1280. Pay is subject to cost-of-living adjustment. Emoluments payable in sterling currency until departure from United Kingdom. " D " grade, first-class passage, including wife and family, at Government expense to Australia. Increment of £A54 15s. is payable after 2 years. General duties to serve as Medical Officers in Naval Hospitals, ships, and establishments of the Royal Australian Navy. First appointment is to a short-service commission for a period of 4 years with prospect, if desired, of transfer to the permanent Naval Forces.

Full details may be obtained from the R.A.N. Liaison Officer, 85, Jermyn-street, London, or Secretary, Department of the Navy, Melbourne, S.C.1.

SUDAN GOVERNMENT. The Ministry of Health, Sudan Government, invites applications for an experienced PHYSIOTHERAPIST for service in the Sudan. Duties will be to assist in developing a Physiotherapy Unit in Omdurman Civil Hospital and will include training of Sudanese staff. Applicants must be members of the Chartered Society. Age-limits 28–35. Appointment will be on probation for short-term contract (with bonus) up to 6 years. Salary scale ranges from £E930–£E1050 (annual increases). Starting-rate of pay will be fixed according to age, qualifications, and experience of selected candidates. Cost-of-living allowance in addition to salary is payable at present. Outfit allowance of £E50 is payable when the contract is signed. Free passage on appointment. Annual leave after the first tour.

Further particulars and application form will be sent on receipt of a postcard only, addressed to the Sudan Agent in London, Sudan House, Cleveland-row, London, S.W.1, quoting " Physiotherapist 1212 " and name and address in block letters.

SUDAN GOVERNMENT. The Ministry of Health, Sudan Government, invites applications for the post of MALE OPHTHALMOLOGIST. Candidates should be in the Senior Registrar grade under the National Health Service, and should possess the qualifications of D.O.M.S. or should be aged 30–32 and possess the higher qualification plus considerable experience. Appointment will be on probation for short-term contract (with bonus) up to 6 years. Salary ranges from £E2000 to £E3000 (annual increases). Starting-rate of pay is fixed according to age, qualifications, and experience of selected candidates. An outfit allowance of £E50 is payable when the contract is signed. No income-tax is at present payable in the Sudan. Free passage on appointment. Annual leave after the first tour. Candidates for this post may apply for secondment from the National Health Service for period of 3 years under the terms of circular letter No. RHB/(52)106 BG(52)101 of 30th September, 1952, in which case the contract with the Ministry of Health, Sudan Government, will be for that period.

Application forms may be obtained on application to Dr. E. P. PRATT, 93, Harley-street, London, W.1, quoting " Ophthalmologist " and name and address in block letters.

SUDAN GOVERNMENT. The Ministry of Health invites applications for posts of GYNÆCOLOGICAL SPECIALISTS. Candidates, who may be Male or Female, should be in the Senior Registrar grade under the National Health Services, and should possess the qualifications of M.R.C.O.G. or should be aged 30–32 and possess the higher qualifications plus considerable experience. Appointment will be on probation for short-term contract (with bonus) up to 6 years. Salary scale ranges from £E2000 to £E3000 (annual increases). Starting-rate of pay is fixed according to age, qualifications, and experience of selected candidates. An outfit allowance of £E50 is payable when the contract is signed. No income-tax is at present payable in the Sudan. Free passage on appointment. Annual leave after the first tour. Candidates for this post may apply for secondment from the National Health Service for period of 3 years under the terms of circular letter No. RHB/(52) 106 BG(52) 101 of 30th September, 1952, in which case the contract with the Ministry of Health, Sudan Government, will be for that period.

Further particulars and application forms may be obtained on application to the Sudan Agent in London, Wellington House, Buckingham-gate, London, S.W.1. Please mark the envelope " Specialist 1211."

WARWICKSHIRE COUNTY COUNCIL. County Medical OFFICER OF HEALTH'S DEPARTMENT. Applications are invited from registered medical practitioners for the permanent appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH (Male or Female). Preference will be given to those holding D.P.H. or D.C.H. and with previous experience. Salary according to experience within the scale £850 p.a. rising by annual increments of £50 to a maximum of £1150 p.a. The post is superannuable and appointment is subject to the production of a satisfactory medical certificate. The successful candidate will be required to provide and use a motor-car in the performance of his or her duties for which a mileage allowance is payable.

Further particulars (including details of area) and application forms may be obtained from the County Medical Officer of Health, Shire Hall, Warwick. Closing date for applications is 7th February, 1953. L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 5th January, 1953.

General Practice

For an **Executive Council** *post apply on form* **E.C.16A** *obtainable from the council Mark envelope* **"Vacancy."**

LEAMINGTON SPA, WARWICKSHIRE. Applications are invited for VACANCY due to resignation. List approximately 1180. Residence and surgery available for purchase. Apply on Form E.C.16A to the undersigned, not later than 8th February, 1953.

R. V. NELLTHORP, Clerk, Warwickshire Executive Council.

15, Waterloo-place, Leamington Spa.

WALSDEN, TODMORDEN. Applications are invited for VACANCY (Urban and Rural) due to death. List at present approximately 1980. Residence and surgery available for purchase. Apply on Form E.C.16A to the undersigned not later than 7th February, 1953. C. H. STARLER,

Clerk of the West Riding Executive Council.

5, St. John's North, Wakefield, Yorkshire.

Hospital Services : Non-Medical Appointments

BIRMINGHAM. GROUP 25 BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. Required, a BIOCHEMIST to serve in the Pathology Service of this Group working under the general direction of the Group Pathologist. Duties mainly at Little Bromwich Hospital. Salary according to P.T.A. No. 9, depending upon experience and qualifications.

Applications, stating age, experience, and qualifications, to the Secretary, Group Administrative Offices, Oak Tree-lane, Selly Oak, Birmingham, 29.

SOUTH WORCESTERSHIRE HOSPITAL MANAGE-MENT COMMITTEE invite applications for the post of BIOCHEMIST in the Group Pathological Department at Worcester Royal Infirmary, vacant on 1st April, 1953. Principal or Senior Grade according to qualifications and status.

Applications, giving the names of 3 referees, to be sent not later than 9th February, 1953, to the Secretary.

Appointment : Too Late for Classification

GLASGOW ROYAL INFIRMARY. Junior Hospital MEDICAL OFFICER (plastic surgery and burns).

Write, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

Miscellaneous

EAST LANCASHIRE HOMES FOR DISABLED SAILORS AND SOLDIERS, BROUGHTON HOUSE, Park-lane, KERSAL, MANCHESTER. Applications are invited for the post of RESIDENT MEDICAL SUPERINTENDENT. Single man or widower. Salary £650 p.a. and full residential emoluments. Position would suit retired Service Officer. The Homes are not included in the National Health Service Scheme.

Apply to E. MESSENGER, F.C.A., Secretary.

18, Booth-street, Manchester, 2.

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Internationally known Indian Professor of Biochemistry in Medical College (53), nutrition and therapeutic research expert, open to fresh engagement end of 1953. Ready undertake direction of teaching and research in teaching institution and manufacturing firm.—Please write : Address, No. 778, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, January 24, 1953.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

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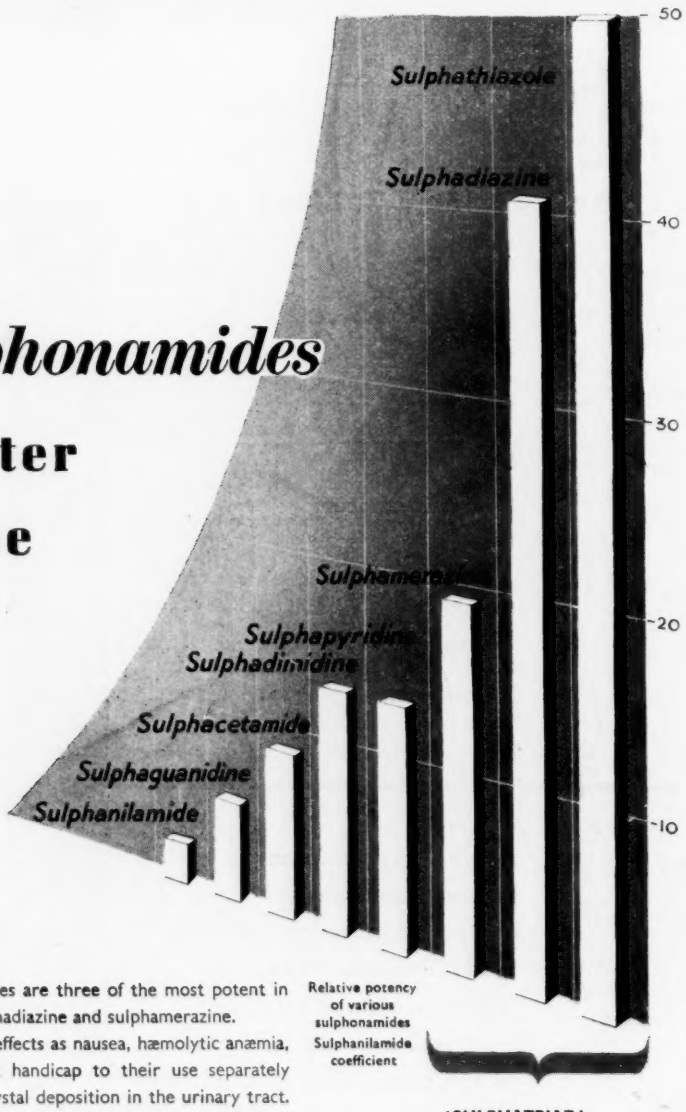

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